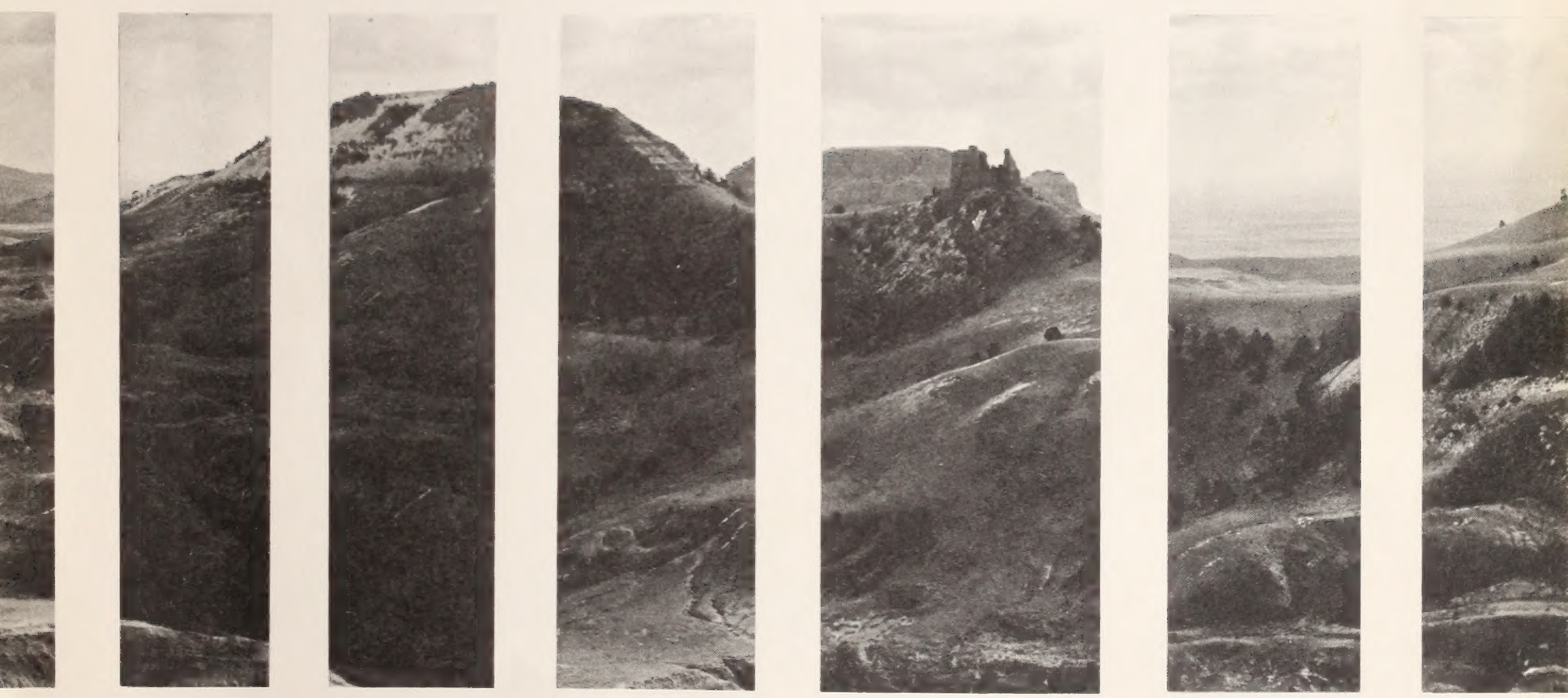
U. S. Department of the Interior
Bureau of Land Management
Rock Springs District, Wyoming



Sandy Grazing Environmental Statement

FINAL

DEPARTMENT OF THE INTERIOR

FINAL

ENVIRONMENTAL STATEMENT

PROPOSED DOMESTIC LIVESTOCK GRAZING MANAGEMENT PROGRAM FOR THE SANDY AREA

Prepared by

BUREAU OF LAND MANAGEMENT

DEPARTMENT OF THE INTERIOR

State Director, Wyoming State Office

SUMMARY

( ) Draft (x) Final Environmental Statement

U. S. Department of Interior, Bureau of Land Management, Rock Springs District, Wyoming

1. Type of Action: (x) Administrative ( ) Legislative

2. Brief Description of Action: Fully implement within eight years the grazing systems of sixteen allotment management plans (AMPs) and 33 custodial pastures providing for livestock grazing management and use of available forage on approximately 1,997,330 acres and maintain management of a 970-acre no grazing area. (There also are Federal withdrawals totaling 1,750 acres within the 2,000,050 acres of the Sandy area on which the Bureau of Land Management does not administer livestock grazing.) Each AMP would establish the following: (1) season of use for each class of livestock, (2) proper livestock grazing capacity, (3) the total allowance of wildlife and wild horse Animal Unit Months (AUMs) available, 33,799 and 9,600, respectively, (4) allotment and pasture boundaries, (5) the proper grazing treatments for each allotment, and (6) allow conversions of some livestock qualifications in AUMs from the existing predominantly sheep use to cattle use as requested by livestock operators from 138,047 AUMs to 114,885 AUMs.

   Purposes of the proposed action are to: (1) protect and enhance the vegetative resource; (2) allow operators to convert qualification from sheep to cattle; (3) increase vegetal production within each allotment so that within 23 years the optimum number of livestock AUMs (154,028 AUMs) can be provided; (4) provide 33,799 AUMs of forage for wildlife to maintain the desired populations; (5) provide 9,600 AUMs of forage to maintain a total of 800 wild horses; (6) protect primitive and visual values within the Red Desert by establishing a no-fence area; (7) permit wild animal movement by using only the minimum miles (length) and type of fence that does not prohibit migration; (8) increase stream channel stability on approximately 300 miles of 35 streams to improve fish habitat; and (9) decrease soil erosion from approximately 8 million tons per year to approximately 7 million tons per year.

   Proposed grazing systems include 3-pasture rest-rotation for nine allotments, combination 2-pasture alternately grazed and 3-pasture rest-rotation for three allotments, and 3-pasture deferred, 2-pasture alternately grazed, 4-alternately grazed, and 2-pasture deferred systems on the remaining allotments. Approximately 141 water developments (springs, wells, and reservoirs) and 536 miles of fence would be required to implement the proposed grazing systems.

3. Summary of Environmental Impacts of the Proposed Action: Long-term cumulative impacts expected to occur as a result of the proposed grazing systems summarized by resource element include: Soils--Sheet erosion should be reduced and soil compaction would increase around new water developments; Vegetation--Vegetal production,composition and plant vigor should increase; Water--Ten-year storm runoff should be reduced and sediment yield should decline; Terrestrial Wildlife--Fences would restrict movement to and within crucial habitat; Aquatic Wildlife--A reduction is anticipated due to increased utilization of streambank vegetation and physical damage to streambanks; Wild Horses--Fences would restrict movement and could cause injury. High stress (or death) could occur when water developments are shut off. Cultural--Displacement and loss of artifacts could occur as a result of livestock trampling and construction of range improvements. Visual--Fencing could create an adverse visual impact; Recreation--Visitor-days are expected to increase; Livestock grazing--An increased cost is expected due to maintenance needs of range improvements. Available forage is expected to increase. Livestock and recreation income would slightly increase in the region with increases in available AUMs and visitor-days in the Sandy area.

4. Alternatives Considered:

   1. Continuation of present use (no action).
   2. Discontinuation of domestic livestock grazing.
   3. Allow conversions without fences.
   4. Livestock grazing program as proposed by the Sandy livestock operators.
   5. Reductions of grazing capacities on allotments with excessive soil erosion and poor range conditions for livestock.
   6. Site-specific recommendations.
   7. Wildlife and wild horse management goals.

5. Comments Have Been Requested and Received From the Following:

   See page iv. Comments on the Draft Statement were received from those organizations marked with an asterisk.

6. Draft Statement Made Available to EPA and the Public: May 26, 1978.

7. Final Statement Made Available to EPA and the Public: Sept. 29, 1978.

5. <u>Comments Have Been Requested and Received From the Following</u>:

FEDERAL AGENCIES

Department of the Interior
- *Geological Survey
- *Fish and Wildlife Service
- Bureau of Reclamation
- *National Park Service
- *Heritage Conservation and Recreation Service

Department of Agriculture
- *Forest Service
- *Soil Conservation Service

*Environmental Protection Agency
*Advisory Council on Historic Preservation

STATE AGENCIES

*Office of the Governor
*Planning Coordinator's Office-State Clearinghouse (Distributes to State Agencies)

LOCAL GOVERNMENT

*Sweetwater, Lincoln, Sublette, and Fremont County Commissioners and Planning and Zoning Commissions

OTHER ORGANIZATIONS

*American Horse Protection Association
Audubon Society
Council for Agricultural Science and Technology (CAST)
*Defenders of Wildlife
Friends of the Earth
*International Society for the Protection of Mustangs and Burros
*Izaak Walton League
National Wild Horse Association
National Wildlife Federation
Natural Resource Defense Council
Northern Rockies Foundation
*Old West Range E.I.S. Monitoring Project
Outdoors Unlimited
*Public Lands Council
*Sandy Livestock Users Association
*Sierra Club
Society for Range Management
The Wildlife Society
*University of Wyoming
*Wilderness Society
Wild Horse Organized Assistance
Wyoming Archeological Society
*Wyoming Farm Bureau
Wyoming Historical Society
Wyoming Outdoor Council
*Wyoming Stock Growers Association
Wyoming Timber Association
Wyoming Wildlife Federation
*Wyoming Wool Growers Association

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VOLUME 2

CHAPTER 1

DESCRIPTION OF THE PROPOSAL

BACKGROUND

Five conservation groups and one individual in October 1973 filed a law suit claiming that the Bureau of Land Management's proposed programmatic environmental impact statement on its livestock grazing program did not comply with the requirements of the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. 4321 et seq., in BLM's administration of the public lands of the United States. The court subsequently approved in June 1975 an agreement between the parties involved requiring completion of 212 site-specific environmental impact statements.

The Sandy area in southwestern Wyoming was designated for the first environmental statement (ES) to be prepared in Wyoming for a number of reasons. The Sandy area includes part of the nationally known Red Desert of Wyoming. The area is sparsely inhabited by man and few of man's activities, except for roads, are apparent to the visitor. Past grazing use was primarily by migratory sheep bands; therefore, fences and permanent dwellings were not necessary for management. However, some of the present livestock operators no longer wish to run sheep and have expressed a desire to convert some sheep use qualifications to cattle use. Fences are considered necessary for proper cattle management at the level of cattle use proposed for the Sandy area (Stoddart, Smith, and Box 1975; per. comm., Dwyer 1973).

The Sandy area is 93% Federal land including national resource land (NRL) (see Glossary) and reclamation withdrawal land directly administered by BLM for grazing purposes. BLM's policy is to manage the land for multiple use. Uses and values in addition to domestic livestock grazing include grazing by large herds of antelope, deer, elk, and wild horses; recreational uses such as hunting, fishing, off-road vehicles (ORV), and enjoyment of the open spaces; watershed, sceintific, and historical values; mineral production; and forestry. Various segments of the public have expressed concern that wildlife and recreation uses would be affected by a large scale fencing program deemed necessary for effective cattle management.

Therefore, requested conversions from sheep to cattle use have not been allowed by BLM until a full assessment of the environmental impacts has been made. Because of this, many livestock operators have been forced to remain with the existing class of stock or, in some cases, to take nonuse (definitions of technical terms used in this ES may be found in the Glossary at the back of the ES) for a number of years while awaiting a BLM decision regarding conversions. Request for conversions had prompted the BLM Rock Springs District Manager in November 1974 to initiate writing an environmental assessment record on improved livestock grazing in the area. This effort was discontinued when the Bureau agreed to prepare site-specific ESs.

The Sandy area was chosen as first priority to obtain a relatively early decision concerning conversions and to determine appropriate mitigating measures if the conversions were allowed. The boundaries of the Sandy area were selected after consideration of the predominance of national resource lands in the area. The continuity of these Federal lands provides increased management flexibility in grazing system design and location of range improvements. The boundaries encompass a sufficiently large area for the cumulative analysis of domestic livestock, wildlife, and wild horse use. The majority of livestock operators within the Sandy area also have requests for full or partial changes in class of livestock which are still pending. This provides for a more complete analysis of the cumulative effect of proposed conversions from predominant sheep use in the area to predominant cattle use, along with the associated fence construction of a relatively unfenced area. Last, most of the allotments are large, and similar impacts over extensive areas would be expected.

In the past the Sandy area was divided into two grazing administrative units: the Little Colorado Unit and the Northeast Unit. The Little Colorado Unit was that area west of Highway 187 (MAP 1-1, located at the end of this chapter), and the Northeast Unit was the area east of Highway 187.

The Little Colorado Unit was adjudicated in 1971 as one area. Grazing licenses have been issued unit-wide, TABLE 1-1 summarizes the authorized use (see Glossary) by domestic livestock in animal unit months (AUMs) since 1968. The Northeast Unit was adjudicated in 1971 into grazing allotments as shown on MAP 8-9, located at the end of Chapter 8. Grazing licenses since 1971 have been issued for those adjudicated allotments; licensed use prior to 1971 was unit-wide. TABLE 1-1 summarizes total authorized use unit-wide. Additional historical background on the adjudication and grazing use of these grazing administrative units is available for review in the BLM Rock Springs District Office.

TABLE 1-1
PAST DOMESTIC LIVESTOCK
USE IN AUMS IN THE SANDY AREA

LITTLE COLORADO UNIT

YEAR	SHEEP ACTUAL	SHEEP NONUSE	CATTLE ACTUAL	CATTLE NONUSE	HORSE ACTUAL	HORSE NONUSE	TOTAL ACTUAL	TOTAL NONUSE	UNIT USE TOTAL*
1968	42,564	9,135	5,853	2,196	125	0	48,542	11,331	59,873
1969	40,640	9,293	5,839	2,352	125	0	46,604	11,645	58,249
1970	28,971	5,576	6,665	1,587	125	0	35,761	7,163	42,924
1971	27,242	11,447	5,945	2,284	125	0	33,312	13,731	47,043
1972	27,170	13,396	5,444	2,784	125	0	32,739	16,180	48,919
1973	25,762	18,727	5,307	2,920	183	0	31,252	21,647	52,899
1974	22,272	14,910	8,835	486	103	0	31,210	15,396	46,606
1975	20,293	17,653	7,025	1,633	133	0	27,451	19,286	46,737

NORTHEAST UNIT

YEAR	SHEEP ACTUAL	SHEEP NONUSE	CATTLE ACTUAL	CATTLE NONUSE	HORSE ACTUAL	HORSE NONUSE	TOTAL ACTUAL	TOTAL NONUSE	USE TOTAL*
1968	46,121	19,017	13,144	4,015	434	548	59,699	23,580	83,279
1969	48,848	20,965	12,513	4,986	434	548	61,805	26,499	88,304
1970	39,007	31,639	6,505	470	451	50	45,963	32,159	78,122
1971	34,502	33,948	19,035	878	451	60	53,988	34,886	88,874
1972	35,229	34,704	16,337	2,053	631	0	52,197	35,757	88,954
1973	26,890	41,210	16,633	1,910	470	0	43,993	43,120	87,113
1974	32,505	38,945	19,013	1,180	901	0	52,419	40,125	92,544
1975	27,439	39,249	21,475	1,173	871	0	49,785	40,422	90,207

TOTAL SANDY AREA

YEAR	SHEEP ACTUAL	SHEEP NONUSE	CATTLE ACTUAL	CATTLE NONUSE	HORSE ACTUAL	HORSE NONUSE	TOTAL ACTUAL	TOTAL NONUSE	UNIT USE TOTAL*
1968	88,685	28,152	18,997	6,211	559	548	108,241	34,911	143,152
1969	89,498	30,258	18,352	7,338	559	548	108,409	38,144	146,553
1970	67,978	37,215	13,170	2,057	576	50	81,724	39,322	121,046
1971	61,744	45,395	24,980	3,162	576	60	87,300	48,617	135,917
1972	62,399	48,100	21,781	4,837	756	0	84,936	52,937	137,873
1973	52,652	59,937	21,940	4,830	653	0	75,245	64,767	140,012
1974	54,777	53,855	27,848	1,666	1,004	0	83,629	55,521	139,150
1975	47,732	56,902	28,500	2,806	1,004	0	77,236	59,708	136,944

*This total represents the total active and nonuse that has occurred since 1968. An additional 10,190 AUMs have been available per year as authorized state and private land AUMs available as exchange of use: 778 AUMs in the Little Colorado Unit and 9,412 AUMs in the Northeast Unit.

PROPOSED ACTION

Description

The Bureau of Land Management's proposed action is to implement a domestic livestock grazing management program on national resource lands within the Sandy Planning Unit (study area) of the Green River Resource Area in the Rock Springs District. The Rock Springs District is located in southwestern Wyoming (MAP 1-1). The land status of the 2,000,050 acres within the Sandy area is shown on TABLE 1-2 and MAP 1-2 which is located at the end of this chapter.

The purposes of the proposed action are: (1) to protect and enhance the vegetation resource which provides the foundation for wildlife habitat, wild horse and livestock forage, forestry products, watershed, recreation, and aesthetic resources; (2) to allow operators to convert their present grazing qualifications to the desired class of livestock—sheep and/or cattle--to stabilize the livestock industry; (3) to increase the vegetal production within each allotment so that in 23 years 154,028 livestock animal unit months (AUMs) can be utilized to help provide the nation's needs for red meat; (4) to provide 33,799 AUMs of forage for wildlife to maintain the desired wildlife populations; (5) to provide 9,600 AUMs of forage to maintain a total of 800 wild horses on the Sandy area; (6) to protect primitive values and visual quality in the Red Desert area by establishing a no-fence area; (7) to permit wild animal movement by using only the minimal miles of fence needed to implement grazing systems and the type of fences that do not prohibit migration; (8) to increase stream channel stability on approximately 300 miles of 35 streams within the Sandy area and thus improve fish habitat; and (9) to decrease soil erosion from approximately 8 million tons per year to approximately 7 million tons per year.

The management proposal relates only to the management of livestock (TABLE 1-3). Draft wild horse unit management plans and draft wildlife habitat plans cover those activities in accordance with BLM's planning system. These plans were prepared at the same time as the AMPs and are available for review in the BLM Rock Springs District Office. Many of the goals and objectives of these other plans are incorporated into the proposal using livestock grazing to achieve those goals (TABLE 1-8).

The grazing management program would involve changing the existing grazing use described in Chapter 2 by initiating three types of management: grazing systems, custodial, and no grazing. See MAP 1-3, included in Volume 3 of the FES.

1. Grazing systems management would be applied on 98% (1,967,730 acres) of the area (MAP 1-3 and TABLE 1-3). Grazing systems management is a planned and documented program of livestock grazing in which livestock are utilized as a tool to improve or maintain the naturally occurring range resources (forage, soil, watershed, recreational and aesthetic values, and wildlife habitat), thus assisting in achieving the multiple use goals of national resource land management. Draft AMPs, which set forth the grazing systems management proposed for the Sandy area, are available for review in the Rock Springs District Office.

2. Thirty-three pastures covering 29,600 acres (12,915 acres of NRL) would be under custodial management (MAP 1-3). Custodial management (currently typical of the Sandy area) is an administrative program consisting of a level of livestock use that insures compliance with terms and conditions of the grazing regulations. The allowed level of use must insure a level of vegetal production that would not deteriorate the renewable resources or the base from which the renewable resources are produced.

3. No grazing is proposed for 970 acres in Palmer Draw (MAP 1-3). This area has been reserved for elk winter use and will be fenced to exclude livestock.

Components of the Management Proposal

The grazing systems management proposal would be implemented on the 16 allotments over an eight-year period (MAP 1-3). The proposal would be implemented through the Bureau's allotment management plan (AMP) program. AMPs serve to document the grazing management proposal for each allotment. The draft AMPs are available for review in the Rock Springs District Office. Three of the 16 allotments (Bar X, Fish Creek, and Gold Creek) are operating under an existing AMP. Each plan includes the following elements of which numbers 2, 3, 4, and 5 are summarized in this chapter on the pages indicated: (1) resource problems; (2) grazing systems (TABLE 1-4); (3) objectives (TABLE 1-8); (4) key species (TABLE 1-10); (5) improvements to be constructed (TABLE 1-13); and (6) monitoring studies. The following steps are used to prepare AMPs:

1. Review the Bureau planning data, collect and analyze additional data (e.g. soils, water, vegetation, wildlife), and contact the range users.
2. Identify resource problems.
3. Establish management objectives.
4. Develop the grazing system.
5. Establish range improvements needed to obtain objectives.
6. Identify studies needed to evaluate the effectiveness of the grazing system in meeting the objectives of the plan.

Implementation and Management Procedures

Administrative actions would include establishing for each allotment the proper class of stock, season of use, livestock grazing capacity (see Glossary), and wildlife reservation in accordance with grazing regulations. The procedures used to determine the grazing capacity are found in BLM Manual 4412.11A. The methodology with an example is located in APPENDIX 2I. TABLE 1-4 reflects the proposed livestock, wildlife, and wild horse use for each allotment based on the 1964-1965 range survey. The proposed livestock use at the start of the program

TABLE 1-2

LAND STATUS

National Resource Lands	1,727,435	acres
Bureau of Reclamation Withdrawal	134,360*	acres
U.S. Forest Service Withdrawal	160**	acres
Fish and Wildlife Service Withdrawal	2,510*	acres
State of Wyoming	87,185	acres
Private	48,400	acres
TOTAL	2,000,050	acres

* The Bureau of Land Management administers the livestock grazing on all of the Bureau of Reclamation withdrawals and 920 acres of the Fish and Wildlife Service withdrawals.

** The Forest Service administers livestock grazing on these lands.

TABLE 1-3

PROPOSED LIVESTOCK MANAGEMENT

	Acres*	Total Livestock AUMs	Number of Areas
Grazing Systems Management	1,967,730	125,515	16
Custodial Management	29,600	1,325	33
No Grazing	970	0	1
Federal Withdrawals**	1,750	0	3
	2,000,050	126,840	55

* Acres and AUMs rounded to nearest 5 acres; see TABLE 1-4 for actual allotment figures and TABLE 1-12 and APPENDIX 1C for custodial management figures.

** See Forest Service and Fish and Wildlife portions of interrelationship section for a detailed discussion of these withdrawals of acreages not administered by BLM.

TABLE 1-4

PROPOSED MANAGEMENT AND USE BY ALLOTMENT

Grazing System Allotment No. 9/ & Name	Proposed Livestock Use in AUMs 1/: Class of Livestock 8/	Season of Use 8/	Federal Land Use At Start of Program 2/	Federal Land Trailing Use 8/	Authorized State & Private Land Use 3/	Total Livestock Use 7/	Wildlife 4/: Competitive Reservation in AUMs 1/	Total Allowance in AUMs 1/	Wild Horses 4/: Competitive Reservation in AUMs 1/	Total Allowance in AUMs 1/	Proposed 5/ Total Forage Use in AUMs 1/
Rest-Rotation 3-Pasture											
6. *Little Colorado 6/ Green River Use Area	Cattle	05/01-01/31	13,150	On	94	13,244					
	Sheep	05/01-11/30	4,189	Demand	30	4,219					
303,791	TOTAL		17,339		124	17,463	143	725	272	1,008	19,196
*Farson Use Area	Sheep	05/01-12/15	13,015	On	547	13,562					
	Cattle	05/01-06/30	71	Demand	6	77					
205,123	TOTAL		13,086		553	13,639	195	937	214	792	15,368
*Big Sandy Use Area	Cattle	05/16-10/31	3,369	On	28	3,397					
	Sheep	06/01-12/15	8,823	Demand	73	8,896					
218,042	TOTAL		12,192		101	12,293	333	1,617	None	None	13,910
7. *Red Desert	Cattle	05/01-12/15	10,579		923	11,502					
245,375	Sheep	11/01-12/15	4,662		415	5,077					
	Dual			146		146					
	TOTAL		15,241	146	1,338	16,725	144	1,067	1,967	5,277	23,069
8. *Bush Rim	Cattle	05/01-12/15	3,166		102	3,268					
104,547	Sheep	07/10-12/15	2,186		90	2,276					
	Sheep			276		276					
	TOTAL		5,352	276	192	5,820	313	1,988	503	1,340	9,148
9. *Continental Peak	Sheep	05/01-07/15	1,663		215	1,878					
	Sheep	07/16-10/15	661		81	742					
88,478	Sheep	10/16-12/15	1,886		244	2,130					
	Cattle	05/01-12/15	1,545		200	1,745					
	Dual			58		58					
	TOTAL		5,755	58	740	6,553	194	998	384	1,183	8,734
10. *Pacific Creek	Cattle	05/01-12/15	4,862		499	5,361					
	Sheep	05/15-10/31	5,500		563	6,063					
202,856	Sheep			240		240					
	TOTAL		10,362	240	1,062	11,664	1,074	5,120	None	None	16,784
11. *Sands	Cattle	05/01-12/15	3,283		75	3,358					
114,852	Sheep	11/01-12/15	579		13	592					
	Dual			100		100					
	TOTAL		3,862	100	88	4,050	508	2,304	None	None	6,354
14. Reservoir	Sheep	05/05-10/31	1,669		469	2,138					
35,545	Cattle	10/16-10/31	80		20	100					
	Horses	05/16-10/31	94		26	120					
	TOTAL		1,843	None	515	2,358	74	563	None	None	2,921
15. *Poston	*Sheep	05/05-07/10	979		150	1,129					
50,635	Sheep	09/10-12/15	1,909		290	2,199					
	Cattle	05/16-06/30	300		43	343					
	Cattle	09/01-10/11	242		38	280					
	Horses	05/16-10/31	98		16	114					
	Dual			84		84					
	TOTAL		3,528	84	537	4,149	124	1,047	None	None	5,196
16. *Pine Creek	Cattle	07/01-10/31	732		103	835					
14,089	Sheep	09/01-09/07	184		26	210					
	Horses	04/16-12/31	69		10	79					
	TOTAL		985	None	139	1,124	15	140	None	None	1,264
SYSTEM TOTALS 1,583,333			89,545	904	5,389	95,838	3,117	16,506	3,340	9,600	121,944

TABLE 1-4 (Cont'd)

PROPOSED MANAGEMENT AND USE BY ALLOTMENT

Grazing System Allotment No. 9/ & Name	Proposed Livestock Use in AUMs 1/: Class of Livestock 6/	Season of Use 8/	Federal Land Use At Start of Program 2/	Federal Land Trailing Use8/	Authorized State & Private Land Use3/	Total Livestock Use 7/	Wildlife 4/: Competitive Reservation in AUMs 1/	Wildlife 4/: Total Allowance in AUMs 1/	Wild Horses 4/: Competitive Reservation in AUMs 1/	Wild Horses 4/: Total Allowance in AUMs 1/	Proposed 5/ Total Forage Use in AUMs 1/
Alternately Grazed 2-Pasture											
2. Fish Creek 7,237	Cattle	05/16-08/15	657		231	888					
	TOTAL		657	None	231	888	6	55	None	None	943
SYSTEM TOTALS 7,237			657		231	888	6	55			943
Combination Alternately Grazed 2-Pasture & Rest-Rotation 3-Pasture											
4.*Little Sandy Little Prospect 185,660	Sheep	05/16-10/05	2,599		311	2,910					
	Cattle	05/16-10/31	8,324		984	9,308					
	Dual	Spring		210		210					
	Dual	Fall		184		184					
	TOTAL		10,923	394	1,295	12,612	1,391	9,117	None	None	21,729
12.*White Acorn 46,794	Cattle	06/01-10/15	2,286		782	3,068					
	Sheep	05/16-10/31	1,460		500	1,960					
	Dual	Spring		349		349					
	Dual	Fall		7		7					
	TOTAL		3,746	356	1,282	5,384	217	1,279	None	None	6,663
13. Prospect Mountain 66,751	Cattle	05/16-10/31	2,306		599	2,905					
	Sheep	05/16-09/10	1,239		322	1,561					
	Sheep	Spring		127		127					
		Fall		80		80					
	Cattle	Spring		6		6					
		Fall		5		5					
	TOTAL		3,545	218	921	4,684	504	3,750	None	None	8,434
SYSTEM TOTALS 299,205			18,214	968	3,498	22,680	2,112	14,146			36,826
Alternately Grazed 4-Pasture											
3.*Gold Creek 30,525	Cattle	06/01-10/31	2,692		829	3,521					
	TOTAL		2,692	None	829	3,521	275	1,229	None	None	4,750
SYSTEM TOTALS 30,525			2,692		829	3,521	275	1,229			4,750
Deferred 2-Pasture											
5. Steamboat Mountain 40,537	Cattle	05/01-12/15	1,411		199	1,610					
	Sheep	Spring		80		80					
	Sheep	Fall		20		20					
	TOTAL		1,411	100	199	1,710	481	1,344	None	None	3,054
SYSTEM TOTALS 40,537			1,411	100	199	1,710	481	1,344			3,054
Deferred 3-Pasture											
1. Bar X 6,895	Cattle	06/01-10/15	355		437	792					
	Sheep	06/01-10/15	32		38	70					
	Horses	06/01-10/15	7		10	17					
	TOTAL		394	None	485	879	74	519	None	None	1,398
SYSTEM TOTALS 6,895			394		485	879	74	519			1,398
GRAND TOTALS 1,967,732			112,913	1,972	10,631	125,516	6,065	33,799	3,340	9,600	168,915

TABLE 1-4 (Continued)

PROPOSED MANAGEMENT AND USE BY ALLOTMENT

*Indicates the allotments in which the proposal includes an operator's desire to convert from a previously adjudicated class of livestock to that class shown. A total of 1,810,767 acres is in these allotments.

1/ An AUM is the amount of forage 1 cow, 5 sheep, 14.6 pronghorn, 5 deer, 1.5 elk, 1 moose, or 1 horse would eat in 1 month. Pronghorn figure is from Colorado State University Red Desert Fecal Analysis Contract. The complete report is available in the Rock Springs District Office.

2/ Proposed livestock use levels by pasture are available for review in the Rock Springs District Office.

3/ This includes the state and private land AUMs that would be available as exchange of use (see Glossary) under the proposed action.

4/ Competitive reservations are the portions of the livestock diets that overlap with those of wildlife and wild horse diets and which are needed to assure proper amounts of forage would be available for the numbers of wild animals expected in each allotment. Total allowance is the sum of these reservations and the additional forage available that wildlife and/or wild horses would use, but livestock would not use. Wild horse allowances represent enough forage for 800 animals for one year (800 X 12 = 9,600 AUMs) or the number of horses that are recommended for the area in the BLM's draft wild horse unit management plans. Wildlife allowances are based on the number of months each species would be expected in each allotment; numbers of animals are estimated from population data provided by the Wyoming Game and Fish Department at the time the AMPs were developed. See TABLE 1-8 for a breakdown of reservations by wildlife species.

5/ Total forage use is the sum of the total proposed livestock use and the total allowances for wildlife and wild horses.

6/ The Little Colorado Allotment is divided into three use areas: Green River, Farson, and Big Sandy.

7/ Total livestock use authorized through the first grazing cycle of each AMP.

8/ See Glossary.

9/ In this table allotments are arranged by grazing system. Number preceding allotment name refers to the order of implementation. Allotments are shown in order of implementation in subsequent chapters.

and through the first grazing cycle represents an average reduction of 17% from the present Federal base property livestock qualifications (138,047 AUMs (TABLE 2-70) minus 144,885 Federal AUMs at the start of the program, including trailing use (TABLE 1-4) = 23,162 AUMs; 23,162 divided by 138,047 = 17%). Proposed wildlife and wild horse use is in accordance with the wildlife and wild horse management plans. These plans are available for review in the Rock Springs District Office. The above administrative actions would be based on the most current inventory data available at the initiation of the program. The level of use in TABLE 1-4 would remain for the first cycle (see Glossary) of the plans. After each cycle of the plan or as additional data become available, an evaluation would be made by BLM to determine if adjustments are appropriate (see APPENDIX 2I).

Wildlife forage reservations included in the proposal are based on that forage for which livestock, wildlife, and wild horses compete. Additional noncompetitive forage is available for wildlife. Noncompetitive forage is that which is not utilized by livestock; therefore, a wildlife reservation is not necessary. The sum of the competitive forage reservation and noncompetitive forage is the total allowable or available for wildlife. Wildlife forage needs were based on wildlife populations provided by the Wyoming Game and Fish Department. Forage availability and use under the proposal are shown in APPENDIX 1B.

Boundary changes for the Pacific Creek, Sands, Bush Rim, Steamboat Mountain, Continental Peak, and Red Desert Allotments would have to be made. These changes would provide for a uniform reduction in operator use due to wild horse and wildlife reservations in those allotments.

Boundaries would also have to be changed for the Little Sandy-Little Prospect Allotment and previously proposed Gold Creek and Willow Creek Allotments. These changes would provide manageable units and reduce construction costs.

Before any water developments are initiated, BLM would file an application to appropriate water with the Wyoming State Engineer's Office in accordance with Wyoming BLM Manual Supplement 7153. This would protect domestic livestock water developed by the Bureau against appropriation for other uses.

TABLE 1-4a is a summary showing present and proposed livestock use in AUMs by land status. It also compares existing grazing qualifications, actual use (see Glossary), and use in the short and long terms.

The draft AMPs have been prepared with input from the operators. Upon completion of the ES, the AMPs would be finalized and become operational administratively either by agreement with the operator(s) or by the district manager's decision. Where the livestock operator(s) do not agree, the AMPs would become operational by district manager's decision which would be subject to appeal in accordance with the grazing regulations (43 CFR 4115.2-3). The District Grazing Advisory Board will review the draft AMPs prior to implementation and make recommendation on the implementation schedule and use of range betterment funds.

TABLE 1-5 shows a typical AMP implementation schedule. The allotments would be implemented in the order shown on TABLE 1-6.

Implementation is proposed by priority and is based on resource values and conflicts requiring attention. These would include:

1. Established AMPs that have been modified and require limited additional projects (Bar X, Fish Creek, and Gold Creek Allotments).

2. Allotments where present cattle use is unrestricted in riparian areas and would require immediate attention (Little Sandy-Little Prospect, Steamboat Mountain, Sands, and Prospect Mountain Allotments).

3. Allotments proposing extensive conversions to cattle use where wild horse and wildlife habitat exists. If not managed, the cattle use could cause depletion of the vegetative resource especially in riparian areas (all allotments except Little Sandy-Little Prospect, Bar X, Fish Creek, and Gold Creek).

The proposed draft AMPs were also prepared to reflect the class of livestock desired by the livestock operators (TABLE 1-4). This would be a change in class of livestock and season of use for some operators in each allotment from that which is presently authorized.

Range suitability studies (see Glossary) for cattle and sheep use under present conditions were conducted as part of AMP development. The studies indicated that parts of the Sandy area which are presently suitable for sheep winter use are potentially suitable for use by both sheep and cattle if adequate water is developed. These studies are available for review in the Rock Springs District Office.

A benefit-cost (B/C) study was conducted on each AMP to determine whether it is an economically feasible plan. Results of the B/C analyses are shown in TABLE 1-7. This ratio measures the change in benefits associated with a change in costs. Total benefits are maximized when the benefit-cost ratio equals one. A ratio that is greater than one indicates that output should be expanded; a ratio of less than one indicates output should be reduced. The studies are available for review in the Rock Springs District Office.

The livestock grazing system serves as the key for the improvement of the range expected from the grazing systems management. Water developments and fences are necessary to implement the grazing systems. Nevertheless, the livestock grazing system stands alone as "the only force under the firm control of the manager that can be applied over practically the entire range area"(Hormay 1970).

Grazing systems (see Glossary) are accepted methods of proper rangeland management. The following statements by Stoddart, Smith, and Box (1975) reflect the thoughts of many range management specialists:

"Range forage is one of the most important resources for meeting the red meat requirements of the world's human population. In the past it has been exploited through heavy, uncontrolled grazing. Today there are principles of scientific management that can be applied to

TABLE 1-4A

PROPOSED LIVESTOCK USE IN AUMS BY LAND STATUS

	Federal Land	Nonfederal Land	Total
Qualifications	137,263	11,757	149,020
Actual Use	77,103	7,753	84,856
Proposed Action Use At Start of Program	114,885	10,631	125,500
Proposed Action Use In Short Term (11 years)	114,885	10,631	125,516
Proposed Action Use In Long Term (23 years)	153,232	13,318	166,050
Long Term Production (23 years)	159,491	13,342	172,833
Present Vegetation Production	128,555	11,896	140,451

TABLE 1-5

TYPICAL AMP IMPLEMENTATION SCHEDULE

Year 1 -	Survey and design boundary fences and water developments. Issue decision on necessary reservations for wild horses and wildlife.
Year 2 -	Construct half the boundary fences. Construct half the necessary waters.
Year 3 -	Construct the remaining half of the boundary fences. Construct the remaining half of the necessary waters. Allow one-half of the proposed conversion from sheep use to cattle use.
Year 4 -	Construct two-thirds of the interior pasture fences. Start grazing system. Start supplemental waters.
Year 5 -	Complete the remaining pasture fences. Complete the supplemental waters.
Year 6 -	Allow remaining conversion from sheep to cattle. AMP fully implemented.

TABLE 1-6
AMP IMPLEMENTATION SCHEDULE BY YEAR

Allotment	Years Needed to Implement AMP After the Start of the Program
1. Bar X	2*
2. Fish Creek	2*
3. Gold Creek	2*
4. Little Sandy - Little Prospect	6
5. Steamboat Mountain	6
6. Little Colorado	6
7. Red Desert	7
8. Bush Rim	7
9. Continental Peak	7
10. Pacific Creek	7
11. Sands	7
12. White Acorn	8
13. Prospect Mountain	8
14. Reservoir	8
15. Poston	8
16. Pine Creek	8

* These allotments currently are under AMPs; this is the time required to fully implement the proposed action.

TABLE 1-7

RESULTS OF BENEFIT/COST ANALYSES OF ALLOTMENTS

B/C Ratio*	Number of Allotments
Less than 1:1	None
1:1 to 2.0:1	8
Better than 2.1:1	8

improve the range resource and insure a sustained yield of goods and services from rangeland. In order to apply these principles, grazing use must be planned and the plan executed. Several planned-grazing systems are available to improve range productivity.

"The first consideration in planning range use is to ensure that the basic plant and soil resources are used in such a way that they continue to be productive under the grazing system employed.

"The selection of a particular system will depend upon the kind of vegetation, the physiography of the range, the kind of animals, and the management objectives of the operator.

"Continuous grazing wherein livestock are placed on the range and allowed to remain yearlong or throughout the grazing season has been shown to result in undesirable successional changes in range forage. To prevent this, specialized systems of grazing management have been used widely. Although differing greatly in details, they have two features in common, a period of rest to allow forage plants to grow unmolested and a systematic grazing schedule among different parts of the range.

"The objectives sought are (1) restoring vigor of forage plants, (2) allowing plants to produce seed, (3) attaining heavier and more uniform utilization, and (4) increasing animal production"

Studies of grazing systems conducted by Johnson (1965), Ratliff and Reppert (1974), and Hormay (1970) support the anticipated results of proper rest and systematic grazing. Agricultural extension specialists from various universities, including Dr. Robert E. Steger of New Mexico State University (1970), stress that the benefits of rotation grazing include:

1. Increases in quantity of desirable vegetation.
2. More efficient use of forage.
3. Savings in labor costs.
4. Facilitation of livestock management.
5. Provision of watershed protection.
6. Promotion of wildlife.

Although ranges have been improved under light stocking continuous use, Steger (1970) states, "Most ranchers cannot economically stock their ranges lightly enough to maintain the better perennial grasses under continuous grazing"

Stoddart, Smith, and Box (1975) concluded, "Despite their disadvantages, proper deferred-rotation and rest-rotation schemes offer the range manager one of the most important tools in obtaining sustained productivity from rangelands"

Thus in allotments within the Sandy area where improvement in the range is desired, grazing systems were designed. A particular grazing system was chosen for a specific allotment based on the natural vegetation occurring in the allotment, the management objectives for that allotment, the professional judgment of the system, author, and the desires of the operators as they fit into the management goals. Management objectives or levels of desired improvement for each allotment, based on a 23-year timeframe are shown in TABLE 1-8. The relationship of the management objectives of the proposed action contained in TABLE 1-8 for Livestock, Wildlife, Watershed, and Wild Horses to the Management Framework Plan (MFP) recommendations and objectives can be found in the Interrelationships section of this chapter. Under the grazing systems each allotment would be divided into two or more grazing pastures which would be grazed, deferred from livestock use at different times of the growing season or rested from livestock grazing for the entire year in a scheduled rotation.

Grazing Treatments

The treatments can be categorized into five basic types--A through E. The treatment sequence and number used would vary, depending on the various environmental elements and management objectives of an allotment. The first cycle after implementation would be as shown on MAP 1-4 (located at the end of this chapter) and TABLE 1-9. The map shows the proposed pasture grazing treatments, while the table shows the acres treated after full implementation of all AMPs. APPENDIX 1A lists the acres and grazing treatments by pasture for one complete grazing cycle.

Treatment A—Graze Season Long. Under this treatment, the pasture would be used from the start of the grazing season until the end of the grazing season. Although dates vary in allotments (TABLE 1-4), the typical dates for the Sandy area are May 1 to October 31. This treatment provides forage for livestock during the time when it is most nutritious for them and promotes the highest weight gain per day (Hormay 1970). A more uniform utilization of all forage species is also obtained during this period.

Treatment B—Rest Until Seedripe, Then Graze. Under this treatment, the pasture is rested until seedripe of the key forage species. The key species and estimated seedripe dates are listed on TABLE 1-10. Although the dates vary with each allotment, a typical starting date would be August 1. At this time, most plants grazed by the livestock have produced a mature seed which would, if planted, germinate under proper climatic conditions. After seedripe, the livestock graze the pasture until removed at the end of the grazing season. A typical date for removal would be November 1.

This treatment provides grazing season rest for forage plants to improve their vigor, make and store food for future growth and maintenance, and produce a mature seed. The grazing of livestock after seedripe: (1) tramples and shatters the seed onto the soil surface; (2) disturbs the soil surface so the seed is covered (plants the seed); and (3) adds additional litter to the soil for soil improvement and erosion control and provides forage for the grazing livestock (Hormay 1970; Stoddart, et al. 1975).

Treatment C—Rest Season Long. Under this treatment the pasture is not grazed for the complete grazing season. A total of over one year's rest is provided the pasture. For example, under a three-pasture rest-rotation grazing system, this pasture would be rested from livestock grazing from November 1 of Year 1 until May 1 of Year 3 or for nineteen months. This rest provides the same benefits to the plants as described under Treatment

TABLE 1-8

MANAGEMENT OBJECTIVES IN GRAZING SYSTEMS MANAGEMENT AREAS BY GRAZING SYSTEM

Grazing System Allotment	Livestock Forage	Aquatic Wildlife	Terrestrial Wildlife1/	Watershed2/	Wild Horses3/
Rest-Rotation 3-Pasture					
6. Little Colorado	Increase livestock forage production by 21,879 AUMs to a total of 63,496.	Increase the channel stability by lowering the average channel stability rating from 102 to 94 on 30 miles of the Big Sandy River and from 90 to 82 on 30 miles of the Green River in the allotment.	Maintain forage for: 42,680 antelope mos 2,923 AUMs 1,164 deer mos 233 AUMs 97 elk mos 65 AUMs 58 moose mos 58 AUMs	Lower the average erosion for the allotment from 2,170.3 tons/year to 1,706 tons/year.	Produce at least 1,800 AUMs for wild horses.
7. Red Desert	Increase livestock forage production by 2,743 AUMs to a total of 18,130.	Reduce livestock impacts on riparian areas to less than 50% shoreline damage around standing waters.	Maintain forage for: 13,830 antelope mos 947 AUMs 409 deer mos 82 AUMs 57 elk mos 38 AUMs	Lower the average erosion for the allotment from 634.1 tons/year to 571.2 tons/year.	Produce at least 5,277 AUMs for wild horses.
8. Bush Rim	Increase livestock forage production by 1,322 AUMs to a total of 6,950.	Reduce livestock impacts on riparian areas to less than 50% shoreline damage around standing waters.	Maintain forage for: 4,973 antelope mos 341 AUMs 4,942 deer mos 988 AUMs 988 elk mos 659 AUMs	Lower the average erosion for the allotment from 799.6 tons/year to 674.7 tons/year.	Provide 1,340 AUMs for wild horse use.
9. Continental Peak	Increase livestock forage production by 1,161 AUMs to a total of 6,974.	Increase the channel stability by lowering the average channel stability rating from 99 to 79 on 6 miles of streams in the allotment.4/	Maintain forage for: 5,920 antelope mos 405 AUMs 1,880 deer mos 376 AUMs 268 elk mos 179 AUMs 38 moose mos 38 AUMs	Lower the average erosion for the allotment from 641.3 tons/year to 547.4 tons/year.	Provide 1,183 AUMs for wild horse use.
10. Pacific Creek	Increase livestock forage production by 2,730 AUMs to a total of 13,332.	Increase the channel stability by lowering the average channel stability rating from 107 to 92 on 48 miles of streams in the allotment.4/	Maintain forage for: 27,177 antelope mos 1,861 AUMs 9,749 deer mos 1,950 AUMs 1,829 elk mos 1,219 AUMs 91 moose mos 91 AUMs	Lower the average erosion for the allotment from 1,422.1 tons/year to 1,165.7 tons/year.	None
11. Sands	Increase livestock forage production 1,860 AUMs to a total of 5,822.	Reduce livestock impacts on riparian zones to less than 50% shoreline damage around standing waters.	Maintain forage for: 9,970 antelope mos 683 AUMs 5,380 deer mos 1,076 AUMs 817 elk mos 545 AUMs	Lower the average erosion for the allotment from 541.2 tons/year to 496.5 tons/year.	None
14. Reservoir	Increase livestock forage production by 144 AUMs to a total of 1,987.	Maintain the channel stability at all average channel stability rating in the miles of the Big Sandy River in the allotment.4/	Maintain forage for: 3,840 antelope mos 263 AUMs 1,200 deer mos 240 AUMs 60 moose mos 60 AUMs	Lower the average erosion for the allotment from 104.7 tons/year to 83.8 tons/year.	None
15. Poston	Increase livestock forage production by 462 AUMs to a total of 4,074.	Maintain the channel stability at a 104 channel stability rating on 3 miles of the Big Sandy River in the allotment.4/	Maintain forage for: 3,854 antelope mos 264 AUMs 3,505 deer mos 701 AUMs 82 moose mos 82 AUMs	Lower the average erosion for the allotment from 198.0 tons/year to 156.4 tons/year.	None
16. Pine Creek	Increase livestock forage production by 352 AUMs to a total of 1,337.	Increase the channel stability by lowering the average channel stability rating from 97 to 92 on 11 miles of streams in the allotment.4/	Maintain forage for: 915 antelope mos 63 AUMs 162 deer mos 32 AUMs 45 moose mos 45 AUMs	Lower the average erosion for the allotment from 31.7 tons/year to 27.0 tons/year.	None
SYSTEM TOTALS	Increase 32,653 AUMs to 122,102.		113,159 antelope 7,750 AUMs 28,391 deer 5,678 4,056 elk 2,705 373 moose 373		9,600 AUMs

TABLE 1-8 (continued)

MANAGEMENT OBJECTIVES IN GRAZING SYSTEMS MANAGEMENT AREAS BY GRAZING SYSTEM

Grazing System Allotment	Livestock Forage	Aquatic Wildlife	Terrestrial Wildlife 1/	Watershed 2/	Wild Horses 3/
Alternately Grazed 2-Pasture					
2. Fish Creek	Increase livestock forage production by 111 AUMs to a total of 768.	Increase the channel stability by lowering the average channel stability rating from 92 to 83 on 6 miles of stream in the allotment.4/	Maintain forage for: 235 antelope mos 16 AUMs 62 deer mos 12 AUMs 27 moose mos 27 AUMs	Lower the average erosion from 16.8 tons/year to 12.2 tons/year.	None
SYSTEM TOTALS	Increase 111 AUMs to 768.		235 antelope 16 AUMs 62 deer 12 0 elk 0 27 moose 27		None
Combination Alternately Grazed 2-Pasture & Rest-Rotation 3-Pasture					
4. Little Sandy-Little Prospect	Increase livestock forage production by 3,669 AUMs to a total of 14,986.	Increase the channel stability by lowering the average channel stability rating from 103 to 91 on 42 miles of streams in the allotment.	Maintain forage for: 15,366 antelope mos 1,052 AUMs 33,628 deer mos 6,726 AUMs 1,537 elk mos 1,025 AUMs 314 moose mos 314 AUMs	Lower the average erosion from 643.6 tons/year to 477.3 tons/year.	None
12. White Acorn	Increase livestock forage production by 237 AUMs to a total of 4,339.	Increase the channel stability by lowering the average channel stability rating from 96 to 81 on 23 miles of streams in the allotment. 4/	Maintain forage for: 3,357 antelope mos 230 AUMs 2,534 deer mos 507 AUMs 454 elk mos 303 AUMs 239 moose mos 239 AUMs	Lower the average erosion for the allotment from 177.1 tons/year to 142.8 tons/year.	None
13. Prospect Mountain	Increase livestock forage production by 1,211 AUMs to a total of 4,974.	Increase the channel stability by lowering the average channel stability rating from 103 to 98. on 25 miles of streams in the allotment.4/	Maintain forage for: 5,278 antelope mos 362 AUMs 13,882 deer mos 2,776 AUMs 437 elk mos 291 AUMs 321 moose mos 321 AUMs	Lower the average erosion for the allotment from 236.8 tons/year to 179.2 tons/year.	None
SYSTEM TOTALS	Increase 5,117 AUMs to 24,299.		24,001 antelope 1,644 AUMs 50,044 deer 10,009 2,428 elk 1,619 874 moose 874		None
Alternately Grazed 4-Pasture					
3. Gold Creek	Increase livestock forage production by 1,516 AUMs to a total of 4,208.	Increase the channel stability by lowering the average channel stability rating from 96 to 90 on the 39 miles of stre in the allotment.4/	Maintain forage for: 2,067 antelope mos 142 AUMs 2,590 deer mos 518 AUMs 679 elk mos 453 AUMs 116 moose mos 116 AUMs	Lower the average erosion from 61.3 tons/year to 52.7 tons/year.	None
SYSTEM TOTALS	Increase 1,516 AUMs to 4,208.		2,067 antelope 142 AUMs 2,590 deer 518 679 elk 457 116 moose 116		None
Deferred 2-Pasture					
5. Steamboat Mountain	Increase livestock forage production by 672 AUMs to a total of 2,183.	Increase the channel stability by lowering the average channel stability rating from 110 to 89 on 10 miles of Jack Morrow Creek in the allotment. 4/	Maintain forage for: 1,645 antelope mos 113 AUMs 3,792 deer mos 758 AUMs 709 elk mos 473 AUMs	Lower the average erosion from 685.3 tons/year to 623.9 tons/year.	None
SYSTEM TOTALS	Increase 672 AUMs to 2,183.		1,645 antelope 113 AUMs 3,792 deer 758 709 elk 473 0 moose 0		None

TABLE 1-8 (continued)

MANAGEMENT OBJECTIVES IN GRAZING SYSTEMS MANAGEMENT AREAS BY GRAZING SYSTEM

Grazing System Allotment	Livestock Forage	Aquatic Wildlife	Terrestrial Wildlife[1/]	Watershed[2/]	Wild Horses[3/]
Deferred 3-Pasture					
1. Bar X	Increase livestock forage production by 74 AUMs to a of 468.	Increase the channel stability by lowering the average channel stability rating from 99 to 79 on 9 miles of the Sweetwater River in the allotment.	Maintain forage for: 360 antelope mos 25 AUMs 1,661 deer mos 332 AUMs 30 elk mos 20 AUMs 142 moose mos 142 AUMs	Lower the average erosion from 14.7 tons/year to 8.7 tons/year.	None
SYSTEM TOTALS	Increase 74 AUMs to 468.		360 antelope 25 AUMs 1,661 deer 332 30 elk 20 142 moose 142		None
SUMMARY TOTALS	Increase livestock forage 40,143 AUMs to 154,028 AUMs.*	Increase the channel stability on 300 miles of stream by lowering the channel stability ratings and reduce livestock impact on riparian zones to less than 50% shoreline damage around standing waters.	Maintain 33,799 AUMs of forage for: 141,467 antelope mos 9,690 AUMs 86,540 deer mos 17,308 AUMs 7,902 elk mos 5,268 AUMs 1,533 moose mos 1,533 AUMs	Reduce the average erosion from 8,378.6 tons/year to 6,925.5 tons/year.	Provide 9,600 AUMs for wild horse use.

* This represents an increase over the proposed total livestock use from the start of the program (TABLE 1-4) to the end of the 23-year timeframe.

1/ Wildlife forage is based on the numbers of each species expected in each allotment; these numbers were estimated from population data provided by the Wyoming Game and Fish Department at the time the AMPs were developed (see TABLE 1-4 for wildlife allowances).

2/ Tons/year are shown in thousands of tons.

3/ Wild horse forage is based on the number of animals (800) suggested for the area in the BLM's draft wild horse unit management plans.

4/ These allotments would also have the objective to reduce livestock impacts on riparian zones to less than 50% shoreline damage around standing waters.

TABLE 1-9

AVERAGE ACRES OF EACH GRAZING TREATMENT FOR ONE GRAZING CYCLE AFTER FULL IMPLEMENTATION OF ALL AMPs

Year of Grazing Cycle	A	B	C	D	E	Total*
1	400,335	651,950	651,980	2,230	261,235	1,967,730
2	421,800	622,770	677,530	2,230	243,400	1,967,730
3	452,790	628,885	643,640	2,545	239,870	1,967,730
4	397,410	653,340	654,885	2,545	259,550	1,967,730
5	424,720	620,645	674,630	2,125	245,610	1,967,730
6	449,870	630,800	646,540	2,125	238,395	1,967,730

*Rounded to nearest 5 acres. Includes NRL, state, and private land. The Palmer Draw area of approximately 970 acres is a no grazing area not included in the grazing treatment. Also, 1,750 acres of Federal withdrawals are not included in the grazing treatments. Each year 29,600 acres would be managed under custodial management.

TABLE 1-10

ESTIMATED PHENOLOGICAL DATES FOR
KEY FORAGE SPECIES BY ALLOTMENT

ALLOTMENT	KEY SPECIES*	SCIENTIFIC SYMBOL	PEAK OF FLOWERING	SEEDRIPE DATE
1. Bar X	Bluebunch wheatgrass	Agsp	7/25	8/15
2. Fish Creek	Bluebunch wheatgrass	Agsp	7/12	8/10
3. Gold Creek	Bluebunch wheatgrass	Agsp	7/25	8/15
4. Little Sandy-Little Prospect	Bluebunch wheatgrass	Agsp	6/25	7/10
5. Steamboat Mountain	Thickspike wheatgrass	Agda	7/15	8/10
6. Little Colorado				
Green River Use Area	Western wheatgrass	Agsm	7/20	8/10
Farson Use Area	Big sagebrush	Artr	9/11	10/20
Big Sandy Area	Big sagebrush	Artr	9/11	10/20
7. Red Desert	Western wheatgrass	Agsm	7/14	8/25
8. Bush Rim	Western wheatgrass	Agsm	7/14	8/25
9. Continental Peak	Western wheatgrass	Agsm	7/14	8/25
10. Pacific Creek	Thickspike wheatgrass	Agda	7/05	8/10
11. Sands	Thickspike wheatgrass	Agda	7/05	8/10
12. White Acorn	Bluebunch wheatgrass	Agsp	6/25	7/10
13. Prospect Mountain	Bluebunch wheatgrass	Agsp	6/25	7/10
14. Reservoir	Bluebunch wheatgrass	Agsp	6/25	7/10
15. Poston	Bluebunch wheatgrass	Agsp	6/25	7/10
16. Pine Creek	Bluebunch wheatgrass	Agsp	7/10	8/10

*Primary species around which management systems are designed.

B and also provides a year's rest for establishment of seedlings which may have germinated as a result of a previous treatment.

Treatment D—Rest Until Peak of Flowering, Then Graze. Under this treatment, the pasture is rested from livestock grazing until the key forage species have reached the peak of flowering stage, full bloom, generally around July 15 (TABLE 1-10). A typical ending date would be November 1. This treatment provides rest long enough for seedlings to make and store food. It is similar to Treatment B; however, it does not provide rest long enough for optimum seed production by the more desirable plants.

Treatment E—Graze Until Seedripe, Then Rest. Under this treatment, the livestock graze the pasture from the start of the grazing season until seedripe of the key forage species. Typical dates of grazing are May 1 to July 31. This treatment is used in place of A in some allotments. It offers similar benefits to livestock as Treatment A, but it shortens the length of time the livestock are in the pasture when compared with Treatment A. It is often used in areas of high wildlife use.

Grazing Systems

The five treatments are used in various combinations to make up the different grazing systems. A grazing system's formula describes the sequence of treatments for the system's first cycle (see Glossary); these treatments are repeated in the same order in subsequent cycles.

Five systems are proposed for grazing systems management: three-pasture rest-rotation, two-pasture alternately grazed, four-pasture alternately grazed, two-pasture deferred, and three-pasture deferred (TABLE 1-11). On some allotments different areas would have different types of systems. Stoddart, Smith, and Box (1975) point out: "Many terms have been used to describe grazing systems and there are inconsistencies in their use. Despite differences in terminology and variations in details all can be considered as belonging to a few basic types" TABLE 1-4 shows the allotments, acreages, and proposed grazing systems that would be used.

Rest-Rotation. Rest-rotation grazing is livestock grazing based on the particular needs of the key plants of the range. It incorporates periodic rest from livestock grazing to increase the plant vigor of the plants, allow seed production, and allow seedling establishment. It also uses livestock grazing to accelerate the natural processes of seed shattering, seed planting, and humus development. Stoddart, Smith, and Box (1975) state that rest-rotation grazing ". . .has been widely accepted in the temperate latitudes of the United States where seasonal grazing is practical and cool-season grasses make up most of the vegetation"

In the Sandy area, this system provides eighteen months of continuous rest from livestock grazing after a seed production and trampling period. MAP 1-4 reflects the proposed treatment per year for each allotment.

Based on studies by Donart and Cook (1970) and Trlica and Cook (1971), this full year of rest may be very important to the maintenance of desirable shrubs and some grasses such as Indian ricegrass. Grazing every year after seedripe of the key grass species may not allow them enough time to build sufficient carbohydrate (food) reserves for maintenance and high level production. The system also places emphasis on enhancing the reproduction processes of the bunchgrasses. This is important in improving vegetation and reducing compaction of heavy concentration areas (FIGURE 1-1) which exist around water sources, driveways, and other use areas. The three-pasture system has been proposed as the method of incorporating the principles of rest-rotation on 1,811,695 acres in the Sandy area.

Three-Pasture Rest-Rotation. The allotment is divided into three pastures of approximately equal livestock grazing capacity. Each year a pasture receives one of the following treatments in the order listed:

Pasture 1-A in Year 1, B in Year 2, C in Year 3;
Pasture 2-B in Year 1, C in Year 2, A in Year 3;
Pasture 3-C in Year 1, A in Year 2, B in Year 3. Treatment E is used in place of A on some allotments based on the management objectives for those allotments.

The first year, livestock would enter Pasture 1 at the beginning of the grazing season. After seedripe of the key species (TABLE 1-10), livestock are allowed to graze Pasture 2. Thus, two pastures are grazed until the end of the grazing season. Pasture 3 is rested for the entire grazing season.

The following year, the livestock would enter Pasture 3 at the start of the season. Since this pasture was not grazed during the first year, it would have abundant growth (both old and new) for livestock use.

Alternately Grazed. Alternately grazed systems involve grazing by livestock every other grazing season and resting the area from livestock grazing the other year. Stoddart, Smith, and Box (1975) describe the system: "Rotation grazing, or alternate grazing, involves subdividing the range into units and grazing one range unit, then another, in regular succession. The rotation system of grazing is based upon the assumptions that animals in large numbers make a more uniform use of the forage, and that a rest from grazing is beneficial to the plant, even though it must support a greater number of animals during the shorter time during which it is grazed. Certainly, proper rotation grazing results in more uniform utilization. Larger numbers of animals in smaller units are forced to spread over the entire area and to use the available forage more uniformly. Trampling is reduced because animals are held on small areas where feed is more abundant and, hence, where less travel is necessary"

Two-Pasture Alternately Grazed. The area would be divided into two pastures of approximately equal livestock grazing capacity. Each year one of the following treatments would be applied to each pasture:

Pasture 1-A in Year 1, C in Year 2;
Pasture 2-C in Year 1, A in Year 2.

The first year, livestock would enter Pasture 1 in the spring and would graze season long. Pasture 2 would be rested that year. The second year, livestock would enter

TABLE 1-11

SANDY AREA GRAZING SYSTEMS

System	Number of Allotments	Acres**
3-pasture rest-rotation grazing	9*	1,811,695 acres
2-pasture alternately grazed	4*	78,080 acres
4-pasture alternately grazed	1	30,525 acres
2-pasture deferred grazing	1	40,535 acres
3-pasture deferred grazing	1	6,895 acres
TOTALS	16	1,967,730 acres

*Of the sixteen allotments, three incorporate rest-rotation and alternately grazed systems on different pastures. Acres for three-pasture rest-rotation and two-pasture alternately grazed systems are separated in this table, thus the totals differ from TABLE 1-4 which combines the rest-rotation and alternately grazed systems for these three allotments. The Little Colorado Allotment is divided into three use areas, each incorporating the three-pasture rest-rotation system.

**Acres are rounded to nearest five; see APPENDIX 1A for exact acreages.

FIGURE 1-1 CONCENTRATION AREA. This is a photo of a typical heavy concentration area around a water development in the Little Colorado Allotment. Stoddard, Smith, and Box (1975) state, "Certainly the rule of thumb of the conservationist should be: 'Keep the sacrifice area to the practicable minimum'."

Pasture 2 in the spring and would graze season long. Pasture 1 would be rested. This system is proposed for 78,080 acres.

Four-Pasture Alternately Grazed. This variation would be used on areas with spring and summer use. The allotment is divided into two areas of approximately equal grazing capacity suitable for either spring or summer use. The two areas are divided again, creating four pastures. Each year one of the following treatments would be applied to each pasture:

Pasture 1-E in Year 1, C in Year 2;
Pasture 2-B in Year 1, C in Year 2;

Pasture 3-C in Year 1, E in Year 2;
Pasture 4-C in Year 1, B in Year 2.

The first year, livestock would enter Pasture 1 (one of the spring use pastures) and graze until seedripe of the key species (TABLE 1-10). The livestock would then be moved to Pasture 2 (one of the summer use pastures) for the remainder of the season. Within this system type, the other two pastures (3 and 4) are rested from livestock grazing every other year and grazed while Pastures 1 and 2 are rested, creating a two-year cycle. The four-pasture alternately grazed system is proposed for 30,525 acres.

Deferred Grazing. Grazing under this system is delayed until the particular time of development for the key plant species. Stoddart, Smith, and Box (1975) state: "Deferred grazing has certain theoretical advantages. If grazing can be deferred every few years, then forage plants have better opportunity to reproduce. Grazing after seed maturity injures plants less and is believed to be beneficial, since animals scatter and trample the seeds into the soil promoting seedling establishment. By allowing important forage plants to grow unhindered during the period most favorable for their growth, they are enabled to produce a greater quantity of seed. Nearly equal advantages result from deferring grazing on plants that reproduce vegetatively"

Two-Pasture Deferred. The grazing area is divided into two pastures of approximately equal livestock grazing capacity. Each year one of the following treatments would be applied to each pasture:

Pasture 1-E in Year 1, B in Year 2;
Pasture 2-B in Year 1, E in Year 2.

The first year, livestock would enter Pasture 1 in the spring and graze until seedripe of the key forage species (TABLE 1-10). After seedripe the livestock would be moved or allowed to move into Pasture 2. After ten to fifteen days, all remaining livestock would be moved out of Pasture 1 and into Pasture 2 for the rest of the grazing season. The two-pasture deferred system is proposed for 40,535 acres.

Three-Pasture Deferred. This type is similar to the system designed by Sampson in 1923 (Stoddart, et al. 1975). The area is divided into three pastures of approximately equal livestock grazing capacity. Each year a pasture receives one of the following treatments in the order listed:

Pasture 1-E in Year 1, E in Year 2, B in Year 3, B in Year 4, D in Year 5, D in Year 6;
Pasture 2-B in Year 1, B in Year 2, D in Year 3, D in Year 4, E in Year 5, E in Year 6;
Pasture 3-D in Year 1, D in Year 2, E in Year 3, E in Year 4, B in
Year 5, B in Year 6.

The first year, livestock would enter Pasture 1 in the spring and would graze until seedripe. After the key species (TABLE 1-10) are at the peak of flowering, the livestock would be allowed to enter Pasture 3. When the key species have reached seedripe, the livestock are moved out of Pastures 1 and 3 and into Pasture 2. The same treatment would be applied two years in succession for each pasture. The three-pasture deferred system is proposed for 6,895 acres.

Grazing System Management. In the proposed systems, use of livestock grazing areas would be controlled in most cases by fences, herding, or limiting available water. Access to water would be controlled by shutting off wells and fencing reservoirs.

Individual operators would move livestock from pasture to pasture by allowing natural drifting and by herding within the timeframes prescribed for each grazing treatment. Livestock would be brought to the Sandy area from other range or ranch property in the spring by trailing through allotments (TABLE 1-4), by trailing on existing road rights-of-way, or by truck. Some of the livestock would then be trailed or trucked to the national forest during the summer. Livestock would be returned by the same methods to the Sandy area in the fall and back to other range or ranch property at the conclusion of the grazing season.

BLM's role in the grazing system would be to ensure compliance with the system and to monitor the impacts of the system. BLM would issue term permits for grazing livestock on each allotment within the framework of the grazing system. The grazing system would specify the grazing area, livestock numbers and class, percentage and season of use, and AUMs to which the permittee is entitled. BLM employees would make routine allotment inspections to ensure that livestock numbers and time of grazing for each pasture comply with that proposed for each grazing system. Administrative actions related to unauthorized use (trespass, see Glossary) would be taken in accordance with BLM Manual 9230. BLM would also conduct studies to provide data for analysis of the plan. They would include, but not be limited to, climate, range condition, trend, utilization, and actual use. BLM Manual 4412 has a detailed description of them.

In addition to these studies, the Bureau would also include studies of wildlife habitat, aquatic habitat, and watershed. They would be designed to monitor progress toward objectives for the AMPs, wildlife habitat plans, and wild horse unit management plans. See Chapter 4 for a detailed discussion. All studies would be initiated prior to full implementation of the AMPs.

If the results of the monitoring studies indicate that the specific objectives are not being achieved or are being exceeded after one complete grazing cycle, modification of the AMPs would be made. Such modification may include changes in the following: the grazing system, amount of use by livestock, wildlife, and wild horses

(either increasing or decreasing), season of use, or any combination of these which would be deemed necessary to achieve the objectives. If livestock, wildlife, and/or wild horse MFP management use levels change over the long term and the studies indicate additional forage is available, then corresponding forage allocations would be made. An environmental assessment would be conducted as necessary prior to any modification outside the scope of this statement.

Any grazing system would be subject to modification if it becomes apparent that environmental deterioration would occur if the system is followed as proposed. If modifications are needed, an environmental assessment record would be prepared prior to implementation of the revised plan. In the event of drought or any other natural cause of range depletion, licensed use would be reduced as necessary in accordance with regulation 43 CFR 4115.2-1(e)(5).

Custodial Management

Custodial management would be applied to 33 pastures in the Sandy area (MAP 1-3). TABLE 1-12 shows the proposed AUMs to be provided on NRL within each custodial pasture.

The custodial management program would include establishing the proper season of use and grazing capacity of the national resource lands. The livestock operators would manage the grazing on the NRL in relation to the adjoining private lands not exceeding the proper season of use and grazing capacity of the NRL. Each year the operator would be billed for the NRL AUMs in accordance with the grazing regulations.

Every three to five years, studies would be conducted by BLM to determine utilization and trend of the resources on NRL. No range improvements are proposed in the custodial management pastures. Project proposals and construction would be initiated by the livestock operator. However, each project would be analyzed by BLM as it is proposed. A permit would be issued if the project was compatible with the environment and other uses of the land.

The management objectives in these areas are basically to keep the range resources at present levels and not develop them further for multiple use. The areas that would be under this system of management are fenced Federal ranges which have been used for a number of years in conjunction with private lands.

No Grazing

A total of 970 acres is proposed for no livestock grazing in Palmer Draw. This area was designated by Wyoming Game and Fish Department personnel as elk winter habitat. On their recommendation, the area will be fenced to exclude livestock (fences are crossable by elk). Thus, all forage produced would be reserved for wildlife.

Range Improvements

Range improvements are structures which facilitate management of the range and livestock. These are constructed to implement the grazing system or to further develop the range to enable more efficient utilization of the forage resource and thus increase animal production. Vallentine (1971) notes, "Range improvements such as stockwater developments, fences, and trails provide the means for more effective management of grazing and thus indirect improvement of the forage resources"

TABLE 1-13 shows the proposed range improvements by allotment. TABLE 1-14 lists the construction requirements by year and their costs. MAP 1-5, included in Volume 3 of the FES, shows the location by allotment and pasture of all proposed improvements.

Well and spring developments would be inspected annually. Reservoirs and fences would be inspected at five-year intervals. Normal day-to-day maintenance or yearly upkeep of improvements would be the responsibility of the operator(s) in return for benefits that accrue to livestock. Twenty-five wells utilized by wildlife and wild horses would be maintained by the BLM. Major repairs or reconstruction would be the responsibility of BLM (TABLE 1-15).

Construction of proposed improvements would require certain procedures and construction practices that would conform to BLM standards. A brief description of those standards and of how each development would be constructed is provided to identify the magnitude of the improvements.

Access

Access to the various construction sites would not require a bladed road. Vehicles would create a two-track trail that would be used to reach the sites for construction and maintenance (FIGURE 1-2). Except for those close to water developments, trails would be abandoned after construction. The trails to water developments would have enough use to keep them active.

Spring Developments

Spring developments would consist of a spring box located directly over a natural spring or a system that collects water from many seeps (FIGURE 1-3). Water from all spring developments would be carried by pipeline to a stock tank located outside the wet riparian zones.

During construction, the spring area of approximately 100 square feet is excavated by backhoe to locate the source of water. If necessary, a spring box and collection system are installed. The box is made so the riparian zone is not completely dried up. Different techniques are used, depending on the spring.

Stock tanks would be connected to the spring box by plastic pipe, $1\frac{1}{4}$ inches or $1\frac{1}{2}$ inches in diameter, buried in a trench excavated by a backhoe. Stock tanks would be 26 inches wide and 200 feet long in sheep use areas and would disturb an area approximately 8 feet wide by

TABLE 1-12

PROPOSED USE ON NRL IN CUSTODIAL MANAGEMENT PASTURES

Area	Acres of NRL	AUMs From NRL	Class	Season
C-1	170	6	Cattle	3/01 to 2/28
C-2	77	5	Cattle	5/01 to 12/15
C-3	144	16	Cattle	5/01 to 12/15
C-4	54	11	Cattle	5/01 to 12/15
C-5	297	20	Sheep	5/01 to 10/31
C-6	503	61	Horses	5/01 to 12/15
C-7	265	29	Horses	5/01 to 12/15
C-8	13	1	Cattle & Sheep	5/01 to 12/15
C-9	96	8	Cattle	6/01 to 10/31
C-10	71	6	Cattle	6/01 to 10/31
C-11	178	11	Cattle	5/15 to 9/15
C-12	66	9	Cattle & Sheep	5/03 to 10/31
C-13	13	5	Cattle & Sheep	5/03 to 10/31
C-14	16	2	Sheep	5/01 to 10/31
C-15	2,209	285	Sheep	5/01 to 10/31
C-16	96	23	Sheep	5/01 to 10/31
C-17	197	14	Cattle	10/01 to 10/31
C-18	120	11	Cattle	5/01 to 10/31
C-19	191	17	Horses	5/05 to 9/30
C-20	3	1	Cattle	5/01 to 10/31
C-21	1,094	125	Cattle	8/15 to 9/15
C-22	19	4	Cattle	7/01 to 10/31
C-23	92	6	Cattle	7/01 to 10/31
C-24	1,197	83	Cattle & Sheep	5/05 to 12/31
C-25	2,153	215	Cattle	7/01 to 9/30
C-26	1,677	212	Cattle	7/01 to 10/31
C-27	98	5	Cattle	5/01 to 9/30
C-28	80	10	Cattle	5/01 to 10/31
C-29	13	1	Cattle	5/01 to 10/31
C-30	1,083	41	Cattle	7/01 to 9/30
C-31	537	75	Cattle	5/01 to 1/30
C-32	85	6	Cattle	5/01 to 1/31
C-33	8	1	Cattle	10/01 to 10/31
TOTALS	12,915*	1,325		

* This represents only the national resource lands in the custodial pastures. The pastures total 29,598 acres; see APPENDIX 1C for NRL, private, and state land status.

TABLE 1-13

PROPOSED RANGE IMPROVEMENTS BY ALLOTMENT

Allotment	Water Developments						Miles of Fence[2/]				
	Reservoirs										
	Pit	Earthfill	Wells[1/]	Springs	3-Strand Wire-Water Fencing (miles)	Miles of Pipeline	3-Strand Barbed Wire	4-Strand Barbed Wire	Removal of Existing 3-Strand Wire Fence (miles)	2-Track Vehicle Access (miles)	Cattle-guards
1. Bar X	2										
2. Fish Creek	1									1	
3. Gold Creek								10			
4. Little Sandy Little Prospect	10	24						73		17	12
5. Steamboat Mountain	3	2					30			2	4
6. Little Colo-rado			23			9	72	95		7	19
7. Red Desert			6		10.3 3/		35			2	5
8. Bush Rim			3		12.0 3/		13			3	1
9. Continental Peak		3	5		2.0 4/		3			4	
10. Pacific Creek			1			5	52				4
11. Sands	11		1	3	0.45 5/	2	60			7	11
12. White Acorn		9						20		7	8
13. Prospect Mountain	1	12		1	0.15 5/			38	5	4	6
14. Reservoir	2	3						14		3	2
15. Poston	3	8		1	0.15 5/	4		15		4	2
16. Pine Creek		1		1	0.15 5/			6		1	1
TOTALS	33	63	39	6	25 6/	20	265	271	5	62	75

1/ Include storage tanks, pipelines, and stock tanks.
2/ Common boundary fence totals have been divided equally between the involved allotments.
3/ Fencing for existing waters.
4/ Fencing for existing and proposed waters.
5/ Fencing for proposed springs.
6/ Total has been rounded to nearest whole mile.

TABLE 1-14

CONSTRUCTION OF PROPOSED RANGE IMPROVEMENTS BY YEAR

IMPROVEMENT	UNITS BY YEAR 1	2	3	4	5	6	7	TOTAL UNITS	UNIT COST	TOTAL COST
Water Developments										
Springs			2	3	1			6	$3,000	$18,000
Wells		12	6	14	1	6		39	25,000	975,000
Pipelines (miles)		4		14		2		20	2,500	50,000
Pit Reservoirs	3		12	11	3	1	3	33	2,000	66,000
Earthfill Reservoirs			14	21	18	10		63	5,000	315,000
Water Fencing (miles)			11	2		12		25	3,400[1/]	81,600[1/]
Two-Track Access Trails	1	5	14	22	9	10	1	62	0[2/]	0[2/]
Fences										
3-Strand Barbed Wire (miles)		41	73	57	84	10		265	2,100	556,500
4-Strand Barbed Wire (miles)	67	54	38	30	29	13	40	271	2,500	677,500
Removal of Existing Fence (miles)		5						5	100	500
Cattleguards	6	12	14	15	16	4	8	75	1,600	120,000
								TOTAL		$2,860,100

1/ Cost of constructing 1 mile of water fencing for springs is included in the unit cost for springs. Therefore total cost is for 24 miles of water fencing.

2/ Access trails would be made without additional cost.

TABLE 1-15

MAINTENANCE OF PROPOSED RANGE IMPROVEMENTS

Improvement	Number of Units	Annual Maintenance Cost/Unit	Responsibility BLM	Responsibility Operators	Estimated Life Of Improvement
Springs	6	$250	0	6	40 years
Wells	39	$400	25	14	40 years
Pipelines	20	$50	0	20	12 years
Pit Reservoirs	33	$40	33	0	20 years
Earthfill Reservoirs	63	$40	63	0	25 years
Water Fencing	25	$150	25	0	20 years
Two-Track Access Trails*	62	None			
3-Strand Barbed Wire	265	$150	0	265	20 years
4-Strand Barbed Wire	271	$160	0	271	20 years
Cattleguards	75	$15	75	0	20 years

*No two-track maintenance included.

FIGURE 1-2 TWO-TRACK TRAIL. This trail in the Little Colorado Allotment shows heavy use.

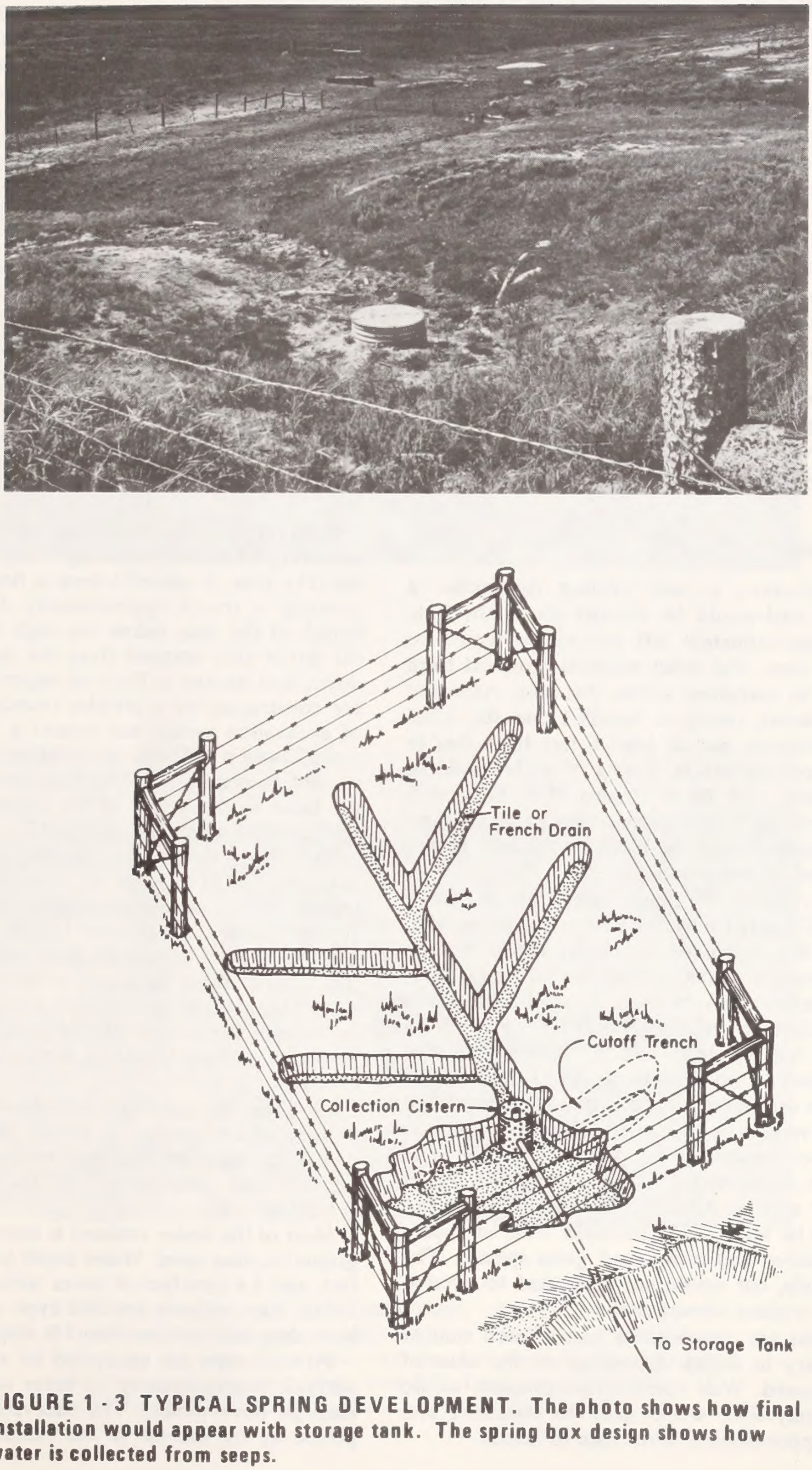


FIGURE 1-3 TYPICAL SPRING DEVELOPMENT. **The photo shows how final installation would appear with storage tank. The spring box design shows how water is collected from seeps.**

200 feet long. Tanks in cattle use areas would be 18 inches high and 6 feet by 14 feet in area. They would disturb an area 8 feet wide by 15 feet long (FIGURE 1-4). The top of either type of tank would not be over 24 inches above the ground level. Small animal escape ramps would be installed in each tank (FIGURE 1-5). Overflow outlets would be placed in tanks to take excess water out of the vicinity of the tank. Overflow design would vary with spring development design.

The pipeline connecting the spring box with the stock tank would be buried with a backhoe and would disturb an average area approximately 10 feet wide by 250 feet long. The area is then leveled and seeded with appropriate introduced and native grass species.

An area of approximately one acre around the spring box would be fenced, using four-strand barbed wire. The fenced area is included in the approximately 0.35 acre of land that would be disturbed with each spring development. The fences would be constructed in the same manner as allotment fences. Average construction time for each spring would be approximately two weeks and would require two men.

Well Developments

During construction, a well drilling rig—either a rotary or cable tool-would be located above the hole area. An area approximately 100 feet square would be disturbed. Mud, rock, and other material removed from the well would be contained within this area. After the drilling is completed, casing is installed and the wells sealed with a concrete pad at least 6 feet by 6 feet in area to prevent contamination. Casing of wells would be done in accordance with BLM Manual 9176. Each well would then have an appropriate pumping facility installed. Most pumps would be submersible, and power would be supplied by generators.

Flowing wells would be capped and flow regulated with a valve. FIGURE 1-6 shows a typical existing well. After the well is constructed, an underground storage tank of approximately 10,000 gallons would be installed on a high spot adjacent to the well. A pipeline connecting the two would be buried (FIGURE 1-6). Water from the storage tank is available for use by wildlife as well as livestock. Pipelines to stock tanks would connect to the storage tank. An area approximately 10 feet wide by 500 feet in length would be disturbed for each pipeline, which would be constructed as described below. The stock tanks, size of pipelines, and area disturbed would be the same for springs. All areas disturbed during construction would be leveled and reseeded with an appropriate mix of native and introduced grass species. The mix would include, but would not be limited to, crested wheatgrass and western wheatgrass.

The stock tanks are considered a part of each well or spring. They vary in design depending on the class of stock to be watered. Well construction projects would take approximately four weeks each to construct and would require approximately three men to install.

Pipelines

Accessory pipelines would be needed in three allotments. The pipes would vary in length from 2 to 14 miles. These pipelines would distribute water from existing or proposed developments to stock tanks located approximately every two miles along the lines.

Construction of the pipelines would be accomplished by using a crawler tractor pulling a ripper. The ripper is a large curved metal tooth approximately 4 inches wide and 3 feet long, mounted on the back of the tractor. The site is first preripped to the desired depth, usually 20 inches. On the second pass, the pipeline, usually polyethylene $1\frac{1}{4}$ or $1\frac{1}{2}$ inches diameter, is placed in the rip. The soil immediately settles back onto the pipeline, leaving a rip about 6 inches high and 12 inches wide over the pipe.

Approximately one acre per mile would be disturbed during construction. This construction would be at the rate of one mile per day and would require approximately five men to do the work.

Reservoirs

Earthfill Type. Earthfill reservoir sites are prepared by removing all debris including rocks and vegetation from the dike area. A cut-off trench is first constructed by excavating a trench approximately 4 feet deep and the length of the dam below the high water level. Suitable fill dirt is then scraped from the surrounding area, laid down, and packed to form an impervious dike. The dikes are constructed by a crawler tractor and scraper. Areas of excavation would not exceed a 3:1 slope. The dikes would have a spillway or overflow outlet with a gradient not exceeding 3%. The water would back up and fill the basin to the height of the spillway, creating a pond upstream from the dike (FIGURE 1-7).

The water surface area would average 2.5 acres. An average of 8.3 acre-feet of water would be contained (Smith 1974), and the average depth of water would be 10 feet when the reservoir is full. Approximately 3.45 acres would be disturbed. Construction would take approximately three days and would involve about three men. Three of the proposed 63 earthfill reservoirs would be fenced. Approximately one-half mile of four-strand barbed wire fence would be required for each fenced reservoir.

Pit Type. Pit reservoirs are created by excavating the bottom of a drainage to collect the water as it flows down that drainage. Pits have various designs, depending on different placements of the excavated material (FIGURE 1-8).

Most of the water retained is located below the former ground surface level. Water depth when full would be 12 feet, and 3.4 acre-feet of water would be retained (Smith 1974). Sites suitable for this type of construction must have deep soil and less than 2% slope.

Pit reservoirs are excavated by a crawler tractor and carryall. Approximately 1.2 acres would be disturbed by each pit development. The excavated material would be placed by the carryall in the vicinity of the pit or exca-

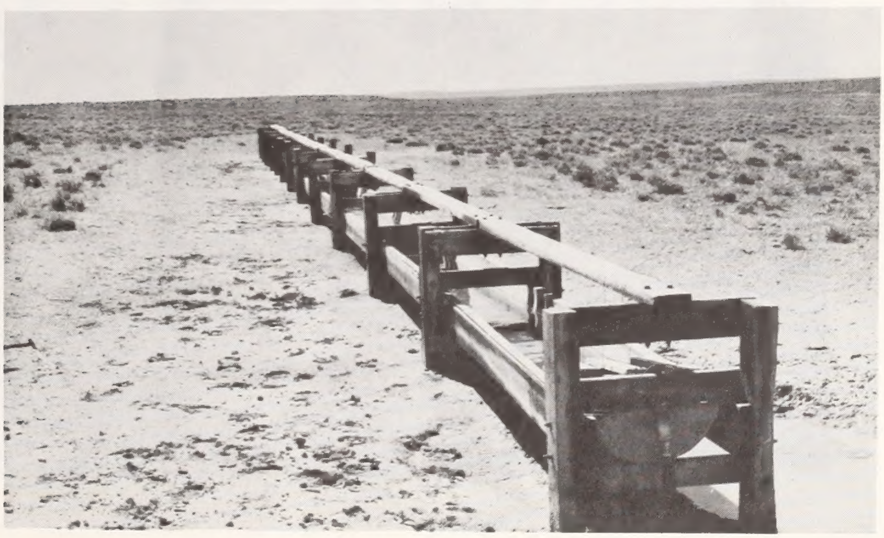


FIGURE 1-4 TYPICAL WATERING TANKS. Cattle watering tanks (top photo) are usually about 18 inches high and 6 by 14 feet in area. Sheep watering tanks (bottom photo) are 26 inches wide and 200 feet long. Neither would be more than 24 inches above ground level.

FIGURE 1-5 TYPICAL SMALL ANIMAL ESCAPE RAMP.
Attached to stock watering tanks, these ramps also provide a perch for animals to drink water.

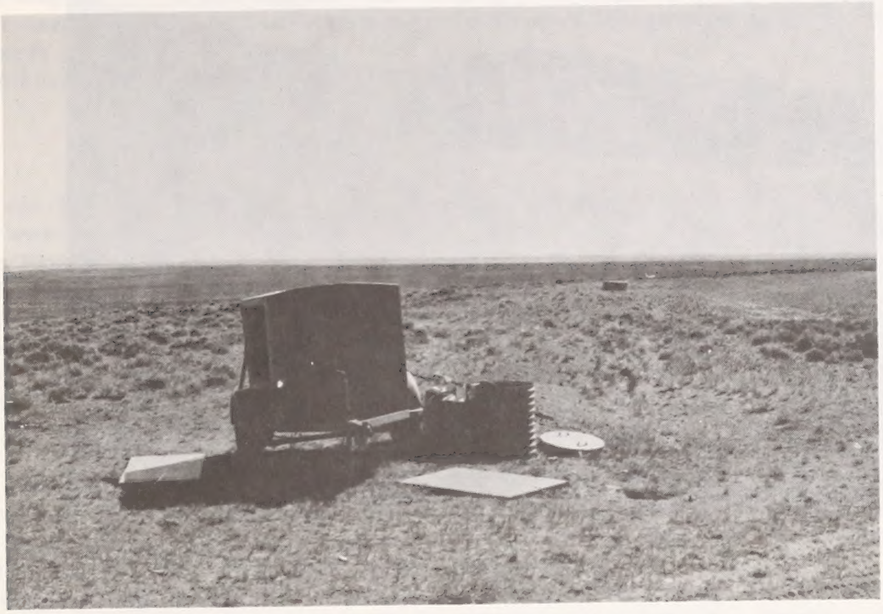


FIGURE 1-6 TYPICAL WELL DEVELOPMENT. Well with submersible pump and portable electric generator (top photo); buried storage tank outlet is in background. Bottom photo shows buried storage tank outlet with stock tanks in the background.

FIGURE 1-7 TYPICAL EARTHFILL RESERVOIR. Earth dikes create ponds that provide water for wildlife and wild horses as well as livestock.

FIGURE 1-8 TYPICAL PIT RESERVOIR. This recently constructed pit reservoir shows the typical horse shoe placement of excavated material.

vation, usually in the form of a horseshoe. Construction time requires an average of two days using three men. Three of the 33 pit reservoirs would be fenced with approximately one-fourth mile of four-strand barbed wire fence each to control livestock access.

Fences

FIGURES 1-9 and 1-10 illustrate typical three and four-strand barbed wire fences as proposed. Three-strand barbed wire fences would be constructed with the top strand being 38 inches above the ground. The bottom strand would be smooth and 16 inches above the ground. Four-strand barbed wire fences would be constructed with the top strand being 38 inches high while the bottom wire would be smooth and located 10 inches above the ground. These standards are outlined in BLM Manual 1737.

These types of fence construction are proposed to mitigate major impacts of fences on wildlife movements. Fence lines would not be cleared. Approximately 10-foot wide two-track trails would occur along fence lines. They would be created during construction as pickup trucks and farm-type tractors move up and down the fence line during surveying, the installation of posts and wire, and the inspection of each fence. Some vegetation within the 10-foot wide track may need to be removed in selected locations to permit wire installation. Where fences cross depressions, swales, or low areas and ground clearance is more than 20 inches below the bottom wire, an additional strand of wire would be installed. It would be weighed down with a rock deadman.

Gates would be installed approximately every mile and at each road crossing where cattleguards are not used. FIGURE 1-11 illustrates typical three- and four-strand barbed wire gates. There would be no additional land disturbed for gates other than those for the adjoining fence. Grey colored metal posts would be spaced one rod (16 feet) apart with wire stays located midway between metal posts. Posts would be installed with a post installer attached to a rubber-tired tractor and would be braced approximately every one-fourth mile, at gates, cattleguards, hilltops, or where the fence changes direction. Five men would be required to install fences at an average rate of 2 miles per day.

Cattleguards

Cattleguards would be 8 feet wide by either 12 or 16 feet in length (FIGURE 1-12). Twelve-foot cattleguards would be located on low use roads where gates would not be appropriate. Sixteen-foot cattleguards would be located on well-traveled BLM or county roads. Cattleguards would be placed on firm bases of concrete or wood and on a grade level with the road. Ribs of the cattleguards would be rounded and spaced approximately 8 inches apart. Wings would be attached to the adjacent fence.

A gate would be located adjacent to every cattleguard. Seventy-five cattleguards would be required, and each would take two men three days to install.

INTERRELATIONSHIPS

Bureau of Land Management's Planning System

The Bureau of Land Management's land use planning documents for the Sandy area were updated in 1975 in accordance with BLM Manuals 1601-1608. The planning system provides guidance for land uses on national resource lands.

The system first identifies and documents the various resources and their current uses, conditions, trends, and problems. This procedure is termed Steps 1-3 of the Unit Resource Analysis (URA). Step 4, the final step of the URA, involves identifying the potential for development of each resource.

Step 1 of the Management Framework Plan includes an evaluation of resource development potentials in accordance with policy, social, cultural, economic, and environmental needs. Activity objectives and recommendations are made for individual resources in this step. In Step 2, the economic, social, institutional, and environmental impacts of each resource recommendation are analyzed and the interrelationships of the recommendations are established. Conflicts between the recommendations are identified and reconciled, then multiple use recommendations are made. Public review and comment on the multiple use recommendations are also solicited in Step 2 of the MFP prior to formulation of Step 3, the broad multiple use management guidelines. Specific resource management plans are prepared within the constraints established by the MFP broad multiple use guidelines.

The proposed action represents specific resource management plans (AMPs) for domestic livestock grazing in the Sandy area. These plans were developed with consideration given to wild horses, wildlife, other multiple uses, and the livestock operators' needs.

Other draft resource management plans developed in the Sandy area include two wild horse unit management plans, one aquatic wildlife habitat management plan, and four terrestrial wildlife habitat management plans. The wild horse plans include recommendations that an average of 150 wild horses be maintained in the Little Colorado Allotment and an average of 650 wild horses be maintained in the Red Desert, Bush Rim, and Continental Peak Allotments as a conglomerate. All other wild horses would be removed from the Sandy area.

Four terrestrial wildlife habitat management plans were developed for the Sandy area. These plans identified key wildlife species (pronghorn antelope, elk, moose, mule deer, and sage grouse), crucial habitat, desirable number of animals, and season of use from data provided by the Wyoming Game and Fish Department. This data

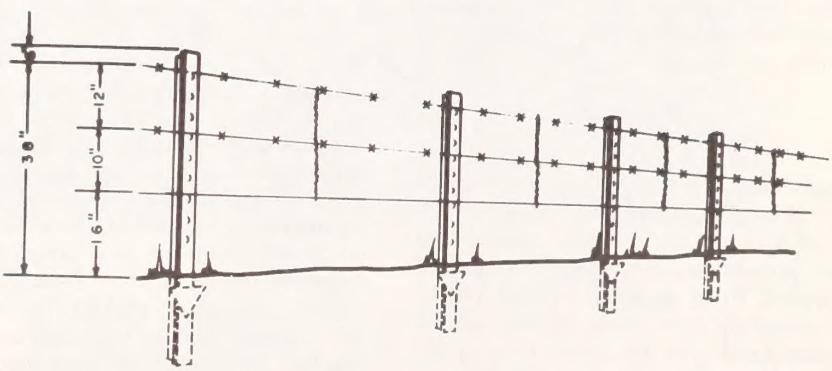


FIGURE 1-9 TYPICAL THREE-STRAND BARBED WIRE FENCE. The bottom strand is smooth to allow wildlife to pass under the fence.

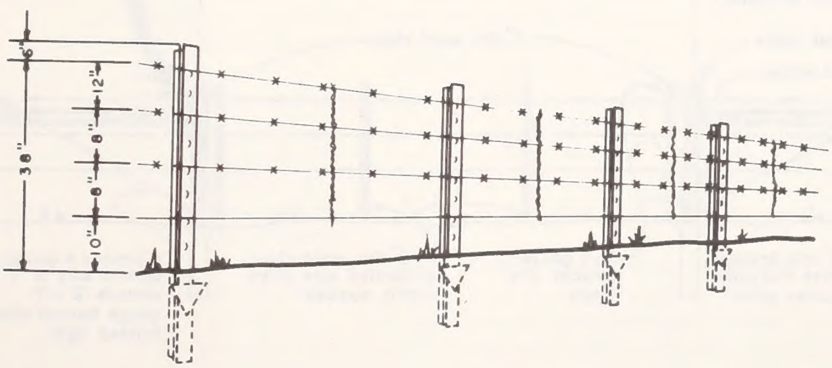


FIGURE 1 - 10 TYPICAL FOUR-STRAND BARBED WIRE FENCE. The smooth bottom wire allows wildlife to pass under the fence.

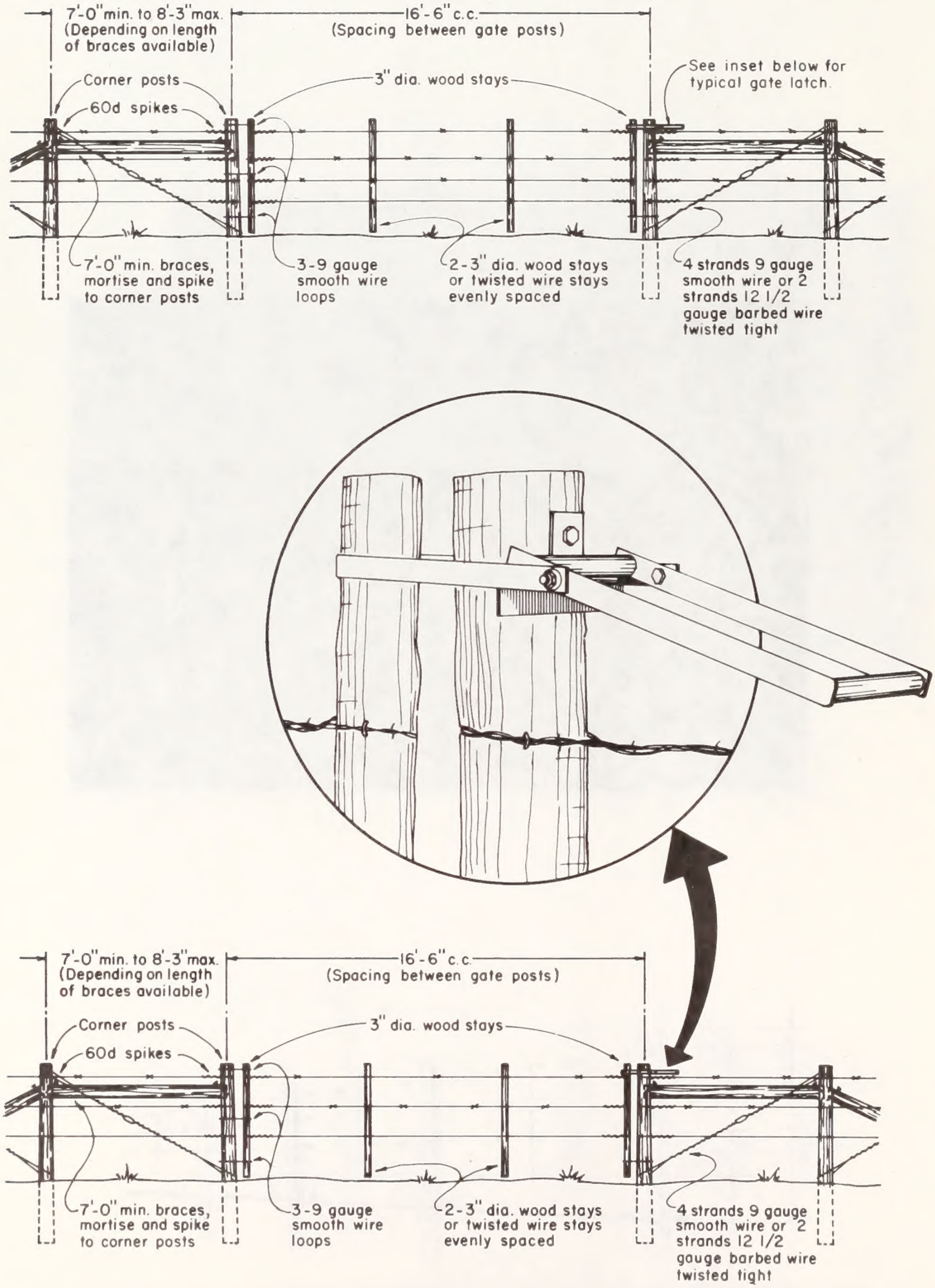


FIGURE 1-11 TYPICAL FOUR-STRAND AND THREE-STRAND WIRE GATES. The gate latch (center) for four-strand (top) and three-strand gates allows easy opening and closing.

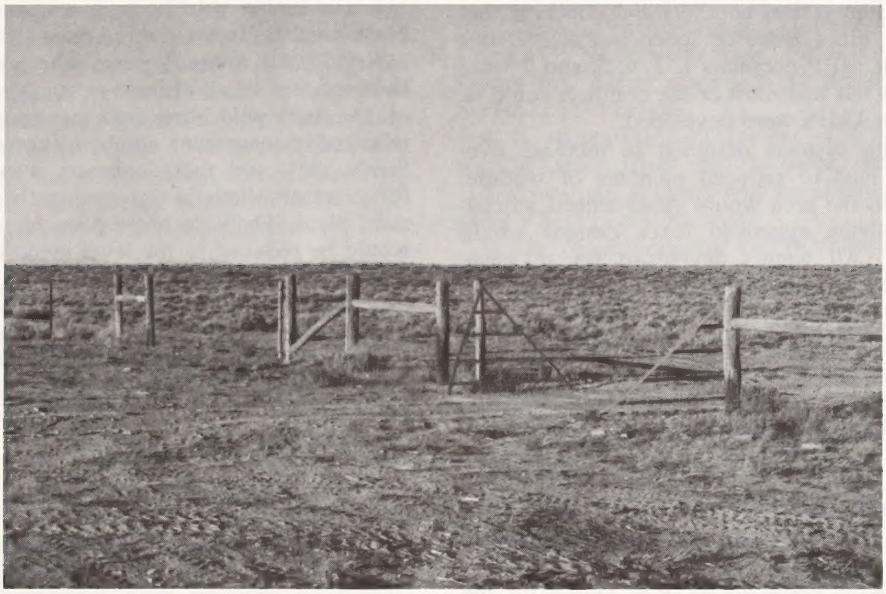


FIGURE 1-12 TYPICAL CATTLEGUARD. The rails of the cattleguard allow easy access for vehicles while stopping domestic livestock.

was then used in developing the AMPs to make forage reservations for wildlife.

A draft aquatic habitat management plan was also prepared to cover all standing and flowing water and riparian habitat in the area. Information and recommendations from the habitat management plans were considered in preparing the AMPs.

Recreation management plans are scheduled to be written during Fiscal Years 1977 and 1978 for the historic trails in the area. No other management plans are underway at this time. The planning system documents and resource management plans are available for inspection at the BLM Rock Springs District Office.

The following summarizes conflicts and concerns that were surfaced by other resource specialists at the time range management MFP decisions 1, 3, 4, 5, and 7 were formulated. It was felt that most of the conflicts could be resolved when the AMPs were developed.

Wildlife. Grazing systems designed to increase livestock use would lead to reduced numbers of wildlife. Any fences built in the area would cause animal mortality; however, utilizing approved fence designs would minimize impacts. All waters developed for or made available to livestock, throughout the area, should also be made available to wildlife.

Recreation and Cultural. The recreation specialists were against all fences that would either conflict with or disrupt open space values and create visual impacts. There should be no fences within corridors along historic trails.

Recreation and Minerals. Specialists were concerned that off-road vehicle (ORV) use, oil and gas exploration and development, and mineral prospecting would be curtailed.

The following MFP decisions serve as guides for the management of the Sandy area.

Range Management.

1. Increase livestock forage and improve range condition through proper management and by designing and implementing grazing management systems where they do not now exist.
2. Align the areas of dominant Federal ownership into manageable allotments.
3. Fence the allotments, as required in an AMP, where livestock are not under immediate supervision and control.
4. Develop waters in all pastures which can be controlled to exclude all grazing animals except those in areas of approved habitat management plans. Wildlife may be allowed access to livestock water developments at any time to attain objectives of the plan.
5. Continue to take over waters discovered by exploration companies. If the well is not in an area covered by an AMP or HMP, it will be taken over but not developed.
6. Where water is needed for livestock, restrict use by the mineral industry.
7. Limit surface use in fragile areas where extensive use adversely affects production or availability of livestock forage.

Relationship to the Proposal. The proposed action essentially is an activity plan that incorporates these management objectives. The grazing systems in the Draft AMP were developed to (1) increase livestock forage and improve range condition; (2) realign some allotment boundaries for more effective management; (3) provide fencing for livestock control; and (4) provide for increased water to the exclusion of the mineral industry. Some waters provided in the proposed action may not be constructed if exploration companies provide waters in those areas.

Wild Horses.

1. Begin removal of all claimed and unclaimed horses down to a management level of 800 horses.
2. Determine wild horse management areas and keep horse numbers to the desired management level.

Relationship to the Proposal. The proposal does not initiate removal of all claimed or unclaimed horses; however, the draft wild horse unit management plans have established management numbers (average of 800) for the Sandy area, and these numbers were used to establish forage reservations in developing the allotment management plans. The wild horse plans identify that the horses would be reduced to the level identified. ". . .to provide for protection of the resource base (vegetation) while maintaining a viable, healthy herd of wild and free-roaming horses. . . " The number of 800 wild horses was the multiple-use recommendation in the Management Framework Plan for the Jack Morrow Planning Unit and is based on past population numbers, habitat requirements, and other uses of the area.

Watershed.

1. Soils information will be used to locate possible project areas.
2. A low intensity soil survey will provide a basis for planning.

Relationship to the Proposal. A low intensity survey has been completed for the Sandy Planning Unit. The final location of proposed projects may be moved to reflect the soils data collected.

Wildlife.

1. Maintain and improve existing habitat for all wildlife through compatible rangeland management.
2. Maintain and increase vegetation diversity and abundance on all drainage bottoms through proper rangeland management supplemented by artificial revegetation as required.
3. Conduct general and specific wildlife habitat inventories to develop habitat management plans and provide sound wildlife information for other activities.
4. Develop habitat management plans consistent with anticipated land use and threatened species priorities.
5. Develop and protect additional wildlife waters supplemented by artificial revegetation as required.
6. Consider the possibility of wildlife mortality in the design of fences, powerlines, etc., and incorporate all practical modifications.
7. Protect Eden Valley wildlife habitat until a habitat management plan is developed.
8. Develop wildlife water in Pine Canyon.
9. Preserve and improve streambanks of Blucher Creek. Protect related furbearer foods and structures.

10. Develop and protect wildlife water in Eighteenmile Canyon and its tributaries to increase animal populations in otherwise suitable habitat.

11. Develop and improve small areas along the Big Sandy River for riparian habitat but leave areas open for livestock water.

12. Expand deer and upland game habitat in Figure Four Canyon by developing water.

Relationship to the Proposal. In summary, the above wildlife recommendations suggest that all possible consideration should be made in management plans for the improvement and maintenance of wildlife food and cover and that wildlife safety should be incorporated into the design of all proposed projects. Draft wildlife habitat management plans have been prepared for the Sandy area, and the following recommendations in those plans were considered in preparing the allotment management plans: minimal miles of fence needed to implement grazing systems; minimal fence design of three-and four-wire antelope type fences; and small animal escape ramps on all waters. The AMPs made forage reservations for wildlife to maintain the desired wildlife populations.

Cultural.

1. A specific plan will be written to protect significant historic trails and sites.

2. All areas will be inventoried for paleontological and archeological significance. Areas that have paleontological and archeological significance will be interpreted and protected.

Relationship to the Proposal. The historic trail and site plans have not been developed. The proposed plan has considered minimal development to protect the historic setting of the trails until the plan can be developed.

The known paleontological sites have now been documented, but protection plans have not been developed. No conflict with the proposal is expected when these plans are developed.

Lands.

1. Lands will be available for rights-of-way and temporary use permits issued as needed for various developments within the unit.

2. Lands not needed for present withdrawals will be restored.

Relationship to the Proposal. The proposed action should have little effect on the lands program. As NRL is withdrawn for various projects, grazing may be stopped on those lands. This would place increased demand for AUMs on the remaining area to produce additional forage.

Minerals.

1. The development of coal will be considered the highest and best use in priority areas as amended by environmental constraints.

2. All land use decisions in high priority coal areas will take into account the possibility of coal leasing within five years.

3. Capital improvements would be placed on lands leased for coal after lessee consultation.

Relationship to the Proposal. Only a small portion of the Sands Allotment is leased for coal development. No coal development is anticipated in the area within the projected 23-year timeframe; thus, no conflicts are expected.

Recreation.

1. In project construction, visual aspect will be maintained as much as possible by use of the visual contrast rating system (see Glossary) in BLM Manual 6320. The system will serve as a guide in determining what is required to reduce potential changes in contrast.

2. Modifying the location or color of planned projects as well as other appropriate measures will be considered to lessen the visual impacts of range improvements so they will blend with or be hidden by the natural landscape.

3. Recreation management plans will be developed on the following campgrounds: (1) Sweetwater, (2) Blucher Creek, (3) Sweetwater Gap, (4) Squaw Creek, and (5) Dutch Joe. These plans will be developed with Forest Service coordination.

4. A recreation management plan will be developed for the Green River and the Boars Tusk Natural Area.

5. Livestock grazing will be eliminated in recreation areas where problems exist.

6. The opportunity for all ORV use in the active sand dune area and public visitation of the area in general will be maintained or increased.

7. A natural area will be designated in the sand dune area of the Sands Allotment (see MAP 2-35 in Volume 3) area of the Continental Peak and the Red Desert Allotments.

8. The Red Desert will be inventoried for designation (consideration) as a primitive area (see MAP 2-35 in Volume 3).

9. All areas will be inventoried for ecological and educational values. Those areas having such values will be interpreted and protected.

10. Snowmobile trails will be designated in cooperation with the U.S. Fish and Wildlife Service, Forest Service, and Wyoming Game and Fish Department.

11. Fences will be built in locations that would have the least impact on surrounding scenery and open space.

Relationship to the Proposal. The proposed plans for the campgrounds and other recreation management plans have not been developed. The proposed action has been held at a low level so the recreation plans can be developed without creating conflicts with the grazing management plan.

Fences are not planned, except around waters, in the Red Desert and Boars Tusk Natural Area to avoid impacts to the natural or primitive values. All fences and other improvements were designed to have minimal visual intrusion from the roads throughout the area. Utilization and protection of groundwater needed for the campgrounds has been considered.

Forestry.

1. Initiate plans for timber development where the potential exists.

2. Thin precommercial timber stands.

3. Offer sales of posts, poles, and fuelwood.

4. Control pest and disease-infected pine stands.

5. Initiate a controlled burning program to thin overstocked stands and remove excess litter.

6. Mitigate any activity that would reduce the timber resource base.

Relationship to the Proposal. The proposed grazing system would moderate grazing impacts to the timber resource by providing a period of rest. As areas are further developed by controlled burning, livestock impacts could become more significant than at present as livestock congregate on burned areas.

Bureau of Reclamation

The Bureau of Reclamation has withdrawn lands within the Sandy area adjacent to the Green River and the Farson-Eden Valley (MAP 1-2). These lands were withdrawn in 1919, 1940, 1941, 1952, 1954, and 1967. BLM has retained, through an agreement, the administration of livestock grazing on these lands.

The Bureau of Reclamation in 1971 requested a relinquishment of approximately 78,000 acres of lands withdrawn for the Eden Project and Seedskadee Project as they are "no longer required for reclamation purposes" The BLM Wyoming State and Rock Springs District Offices are processing the requests for relinquishment. Relinquishment of the withdrawals would return these lands to full management by BLM.

The Bureau of Reclamation, the Bureau of Land Management, and the Soil Conservation Service have been conducting cooperative studies to determine sources of salinity for the Colorado River. The Big Sandy River is identified as one of the major contributors of salinity to the Green River which flows into the Colorado.

U.S. Forest Service

The U.S. Forest Service administers lands just to the north of the Sandy area in the Bridger-Teton and Shoshone National Forests as well as other lands. Twenty-seven or approximately half of the livestock operators that use the Sandy area also graze livestock on the national forests.

Typically, sheep and cattle enter the Sandy area in the spring. The majority of the sheep and a few cattle leave for the national forests in the summer (July) then return in the fall (October) prior to moving to winter ranges, while a majority of the cattle and only a few sheep remain on the Sandy area throughout the summer. Conversions could be made on one without affecting the use of the other. The Forest Service is currently making conversions on a case-by-case basis. Sheep-to-cattle conversions are not made in the Bridger Wilderness Area.

The proposed action has been reviewed by the Forest Service's two district offices in these forests. No conflict was found with the proposal. So far the majority of coordination related to livestock grazing on national resource land and national forests has been between the particular livestock operators and the respective agency.

Approximately 15 wild horses currently living predominantly in the Gold Creek Allotment also spend a limited time on the Shoshone National Forest. BLM plans to remove these horses as they are too small a band for maintenance in view of the large numbers that are planned in the Continental Peak Herd to the south. The Forest Service does not feel the horses could be maintained on the national forest land alone.

There are two Forest Service administrative withdrawals within the Sandy area. There are 80 acres located adjacent to the Dutch Joe Guard Station (Lots 1 and 2, Section 4, T. 30 N., R. 104 W., 6th P.M.) and another 80 acres involving the Sweetwater Guard Station (NW$\frac{1}{4}$NE$\frac{1}{4}$ and NE$\frac{1}{4}$NW$\frac{1}{4}$ Section 19, T. 30 N., R. 102 W.) (MAP 1-3). The entire 80 acres near Dutch Joe is fenced and is used during the summer field season by the Forest Service as a horse pasture. The Sweetwater Guard Station withdrawal includes approximately 30 acres of land that is fenced. The guard station and a small six-unit campground are located within the fenced area. The campground is undeveloped except for two pit toilets and the six camping units. The Forest Service takes care of the administration and cleanup work of the campground. The fenced area is also used by the Forest Service as a horse pasture during the summer field season. The Forest Service administers the grazing for both withdrawals. No change in either withdrawal is proposed.

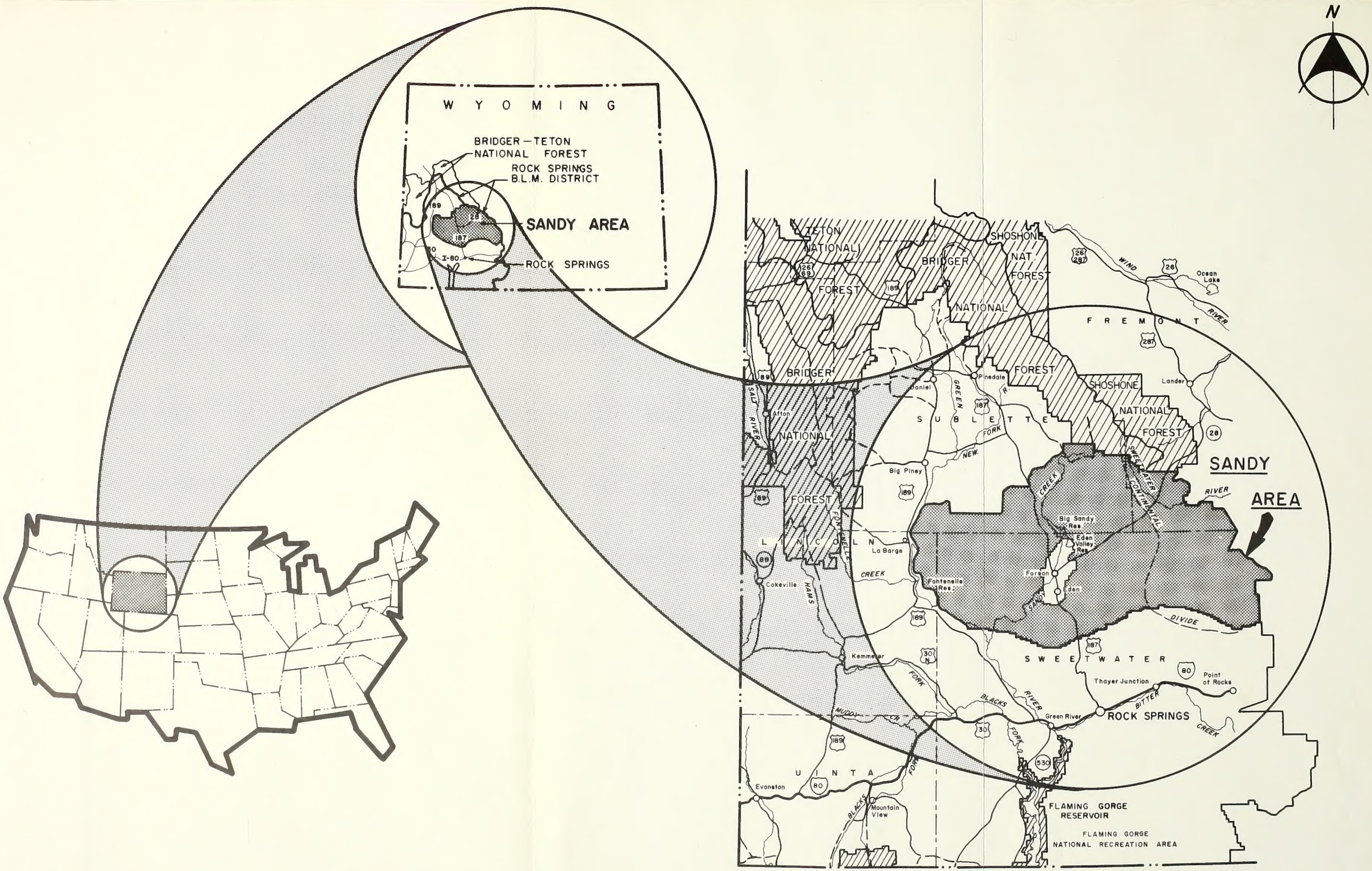
U.S. Fish and Wildlife Service

The Seedskadee Wildlife Refuge lies partially within the Sandy area. The Bureau of Land Management administers the grazing on all unfenced lands by agreement with the USFWS. The refuge lands have the same regulations applied as the adjoining NRL.

The Fish and Wildlife Service has withdrawn 2,510 acres (TABLE 1-2), of which approximately 1,590 acres are fenced out of the Little Colorado Allotment. The grazing on these 1,590 acres is administered by the Fish and Wildlife Service. These lands are grazed every four to five years to improve the forage resource for wildlife. All leases will be on a case-by-case basis and will go to the highest bidder.

Wyoming Board of Land Commissioners

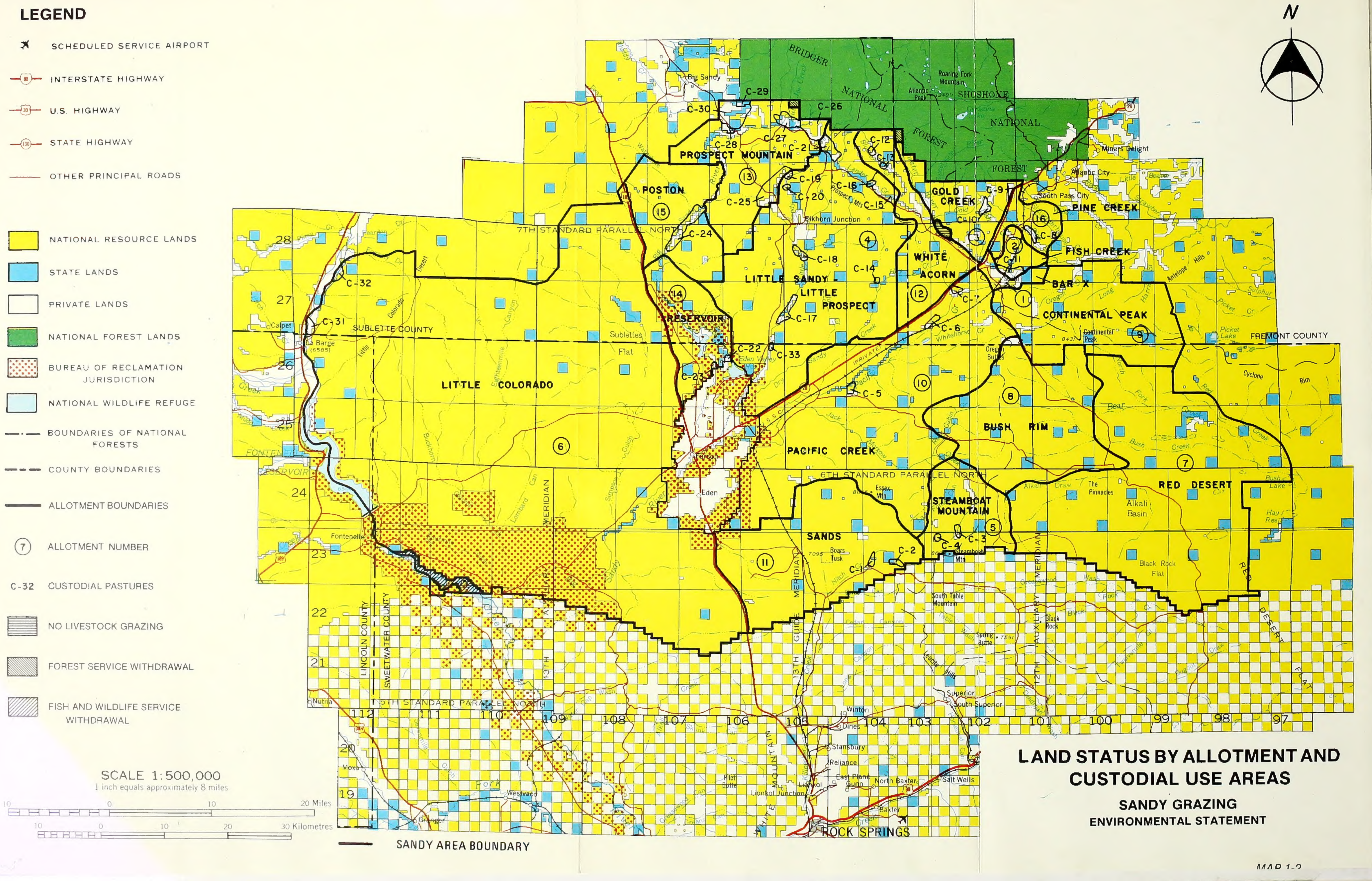
The Wyoming Board of Land Commissioners is responsible for the administration of 87,185 acres of granted State land in the Sandy area. They lease the lands for grazing to livestock operators for a ten (10) year term. The lessee is considered the guardian of the lands, which are not open for public access unless an easement is approved by the Wyoming State Land Board and recorded in the office of the Commissioner of Public Lands. Free use of State land is not permitted and vehicular traffic is prohibited unless on a public access road. A lease of State land provides the lessee the right to make any improvements necessary for the operation of the grazing lease and may sublease the lands provided he has acquired prior Land Board approvals. The Board retains the right to lease the lands for other purposes such as



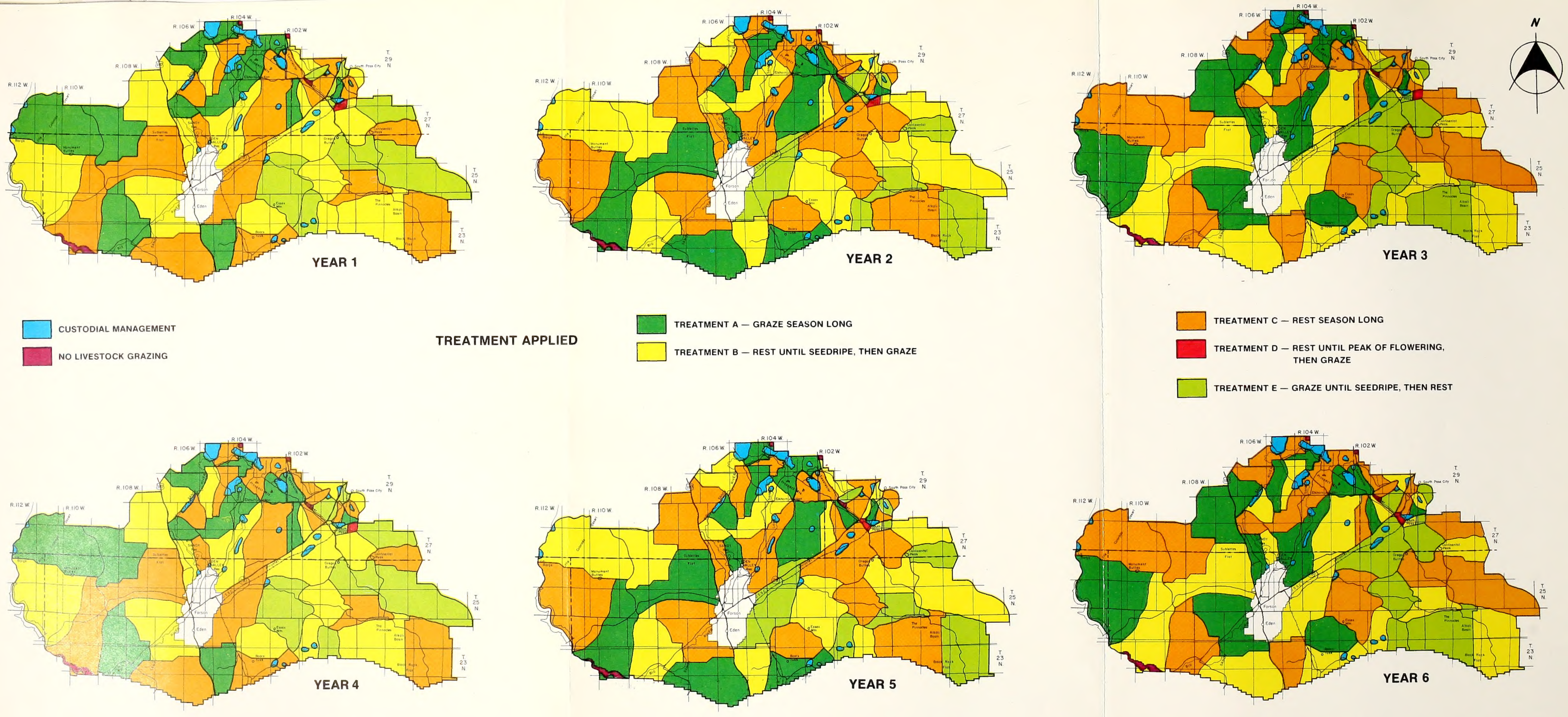
VICINITY MAP

SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 1-1



LAND STATUS BY ALLOTMENT AND CUSTODIAL USE AREAS
SANDY GRAZING
ENVIRONMENTAL STATEMENT



YEAR 1 THROUGH YEAR 6 GRAZING TREATMENT IMPLEMENTATION

SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 1-4

timber harvest and mineral extraction. In addition the Board may grant rights-of-way across these premises with the right of ingress and egress (see Glossary).

Wyoming State Engineer

The Wyoming State Engineer is responsible for the appropriation and administration of the water resources in Wyoming. Applications to appropriate water would be filed with the State Engineer prior to undertaking the proposed water developments.

Wyoming Game and Fish Department

"The Wyoming Game and Fish Department, under the direction of the Game and Fish Commission, is charged with the management of the State wildlife for the benefit of the public. . . .Implicit in this charge is the responsibility of the Department to provide the public with optimum benefits from the available wildlife resource"(Wyoming Game and Fish Department 1976).

Through a memorandum of understanding dated August 19, 1976, the Wyoming Game and Fish Department (WGFD) and BLM work cooperatively to maintain, improve, and manage the wildlife resource. Therefore, the WGFD was consulted and WGFD staff members reviewed the five draft wildlife habitat plans as well as the draft allotment management plans. The desired wildlife population levels provided by the WGFD in 1976 were used to estimate the forage reservation for wildlife found in the proposed action. Other data provided by WGFD were used for the various activity plans.

County

The county planning and zoning commissions have zoned the Sandy area as agriculture. The Sweetwater County Weed and Pest Control Board and the Sublette County Weed and Pest Control Board are conducting active weed site inventories on NRL for control in future years. Inventories indicate the main weed infestations in the Sandy area occur along the Big Sandy River, Little Sandy Creek, and Killpecker Creek. The Sweetwater County Weed and Pest Control Board has started spraying weeds on private lands in the Farson area along the water's edge. One of the objectives of the proposal is to increase or maintain vegetal cover along the streams; if the stream banks were to be sprayed for weed control, the vegetal cover from all broadleaf plants would be reduced. The proposed project would accelerate the revegetation by forage plants of exposed sprayed areas and should help keep weeds at the minimum levels.

Private

The Rock Springs Grazing Association, and Upland Industries are the principal landowners of most of the private checkerboard lands (see Glossary) south of the Sandy area. Nonfederal landowners control 53% of the checkerboard lands immediately south of the Sandy area. The Association has a draft grazing plan for the checkerboard area. The Association's plan would not be initiated until the wild horses could be removed from that area. Wild horses and domestic livestock migrate back and forth between the Sandy area and the checkerboard as the boundary is not fenced. This situation occurs because the checkerboard area is generally free of snow during the winter months and provides forage for these animals. Until the drifting of these animals is limited, a plan on either side would be difficult to carry out.

CHAPTER 2

DESCRIPTION OF THE ENVIRONMENT

EXISTING ENVIRONMENT

This section includes the important elements of the Sandy area today, especially those resources and land uses that could or would be impacted by implementation of the proposed action. Certain resources are identified within the proposed allotment boundaries in order to properly analyze impacts in Chapter 3.

AIR QUALITY

Within the Sandy area, air pollution levels are low. Information gathered from the Wyoming Department of Environmental Quality (DEQ) sampling stations in and around the Sandy area show very low levels of particulate matter. Generally, a level of less than 20 micrograms per cubic meter ($\mu g/m^3$) per quarter is indicated (per. comm., Robert Schick February 5, 1976).

According to air samples taken near the Jim Bridger Power Plant 16 miles south of the Sandy area (Pacific Power and Light-Idaho Power and Light), less than 0.0005 parts per million of sulfur dioxide (SO_2) are present. Nitrogen oxide (N0) levels range from 0.001 to 0.004 parts per million. Both levels are considered to be within State and Federal standards for air quality (Wyoming DEQ 1975; Northern Great Plains Resources Program 1975).

CLIMATE

The climate of the Sandy area is classified as semiarid (Hennebry and Diem 1967; Hunt 1974). The essential feature of a semiarid climate is that the potential evaporation from the soil surface and the vegetation exceeds the average annual precipitation.

Precipitation

The annual precipitation in the area varies from 7 inches at Farson in the central part to more than 12 inches at South Pass City one mile north of the northeast corner of the area (TABLE 2-1 and MAP 2-1 located at the end of this chapter). Peak precipitation months are April, May, and June. The monthly precipitation at Farson varies from 1.52 to 0.05 inches (U.S. Weather Bureau 1960-69).

Snowfall may occur as early as September and as late as July; however, the common period of snowfall is from October to May. Rock Springs, located south of the Sandy area, and the surrounding region averages 44.6 inches of snow annually, although snowfall in excess of 80 inches has been recorded. A snow cover generally remains on the ground during the winter months (U.S. Weather Bureau 1953), and winter sheep grazing in the area depends a great deal on the availability of snow for stock water (Bureau of Land Management 1975). Local snow depth also affects big game activity and movement patterns. "Killer storms"such as those in 1948-49 and 1971-72 cause high mortality among animals due to the combined severity of snow depth, crusting of snow, low temperatures, and high winds.

Temperature

The high altitude and relative low humidity cause considerable variance in Sandy area temperature (TABLE 2-1). Frost-free periods in the Sandy area range from 70 days in the northern part to 100 days in the southeast corner. Freezing temperatures can occur any month of the year. Growing season zones, based on annual mean soil temperatures, are indicated on MAP 2-1, located at the end of this chapter. About 62% of the area has a May 1 to October 1 growing season with 27% from May 15 to September 15 and about 11% from June 1 to September 1.

Native plant growth begins about April 1 and continues to about July 1 with fall green-up occurring if moisture is available and continuing to late October or mid-November (Soil Conservation Service 1975).

Air Movement

Winds are generally from the west and southwest (Becker and Alyea 1964a). The wind velocity averages 10 to 15 miles per hour, but it may exceed 50 at times. High winds contribute to uncovering natural forage so that little supplemental feeding of livestock is necessary (U.S. Weather Bureau 1953).

TABLE 2-1

MEAN PRECIPITATION AND AVERAGE TEMPERATURES
REPRESENTATIVE OF THE SANDY AREA

	Farson		South Pass City	
Month	Mean Precipi- 1/ tation in Inches	Average Temp- erature °F 2/	Mean Precipi- 1/ tation in Inches	Average Temp- erature in °F 3/
January	0.41	9.3	0.89	15.8
February	0.46	14.6	0.91	18.2
March	0.45	23.9	1.10	22.2
April	0.69	37.8	1.49	31.2
May	0.96	47.8	1.32	43.7
June	0.85	55.9	1.35	51.4
July	0.64	62.4	0.78	60.1
August	0.61	60.8	0.90	58.8
September	0.67	51.6	0.83	47.7
October	0.69	39.8	0.98	36.9
November	0.36	24.6	0.85	24.1
December	0.32	13.2	0.76	15.1
ANNUAL	7.11	36.8	12.16	35.4

1/ Source: C.F. Becker and J.D. Alyea, Precipitation Probabilities in Wyoming, Agricultural Experiment Station, University of Wyoming, Laramie, June 1964.

2/ Source: National Oceanic and Atmospheric Administration (NOAA) Environmental Data Service, Climatological Data Wyoming Annual Summary 1975, U.S. Department of Commerce, Asheville, N.C., March 1976.

3/ South Pass City averages not available; estimates computed for purposes of comparison from NOAA and U.S. Weather Bureau annual climatological summaries for 1970-76.

GEOLOGY AND TOPOGRAPHY

The Sandy area lies wholly within the geomorphic province known as the Wyoming Basin (Hunt 1974). The Continental Divide separates the area into the Green River Basin to the west and the Great Divide Basin to the east.

The rocks within the Sandy area are, for the most part, ancient saline lake deposits in the form of conglomerates, sandstones, siltstones, and mudstones. Two unique geologic features are present in the area—the Killpecker Sand Dune Field and Boars Tusk (FIGURE 2-1). The sand dunes are located in part along the southeast border of the area and cover approximately 170 square miles. The field consists of dormant and active dunes, some of which are in excess of 100 feet high. Boars Tusk is a volcanic neck or plug located in the Sands Allotment that was a conduit of an extinct volcano. Erosion has exposed the lava formation.

The mean elevation of the Sandy area is about 7,000 feet (MAP 2-2, located at the end of this chapter). Altitudes range from 9,345 feet at Muddy Ridge on the Wind River Front to 6,340 feet at the point where the Green River exits the Sandy area.

Most of the Sandy area is characterized by the slightly undulating to nearly level land depicted in FIGURE 2-2.

Canyons and distinctive sandstone and tuffaceous ridges and buttes dominate much of the landscape surrounding the Continental Divide (FIGURE 2-3). Topographic relief in this area is from 400 to 600 feet.

The western boundary of the Sandy area is characterized by tablelands dissected by gullies, canyons, and to a lesser extent by broad ancient stream valleys. Topographic relief in this area is from 200 to 400 feet. The area is gently sloping to the east.

SOILS

The Sandy area soils are classed with the desert soil groups of the Wyoming Basin (Hunt 1974). In his discussion of these soils, Hunt (1974) says: "The surface layer typically contains little organic matter and is calcareous, for leaching is slight. Subsoils...contain a layer enriched with lime and/or gypsum....Because the Wyoming Basin is semiarid and weathering correspondingly light, the soil textures and compositions are dominated by the parent materials"

There are three basic types of parent material: (1) coarse-textured old alluvium (water transported sediments) of the Wind River Mountains have formed coarse-textured soils (sandy) over the northeastern portion of the area; (2) sedimentary rocks (sandstone, shale, and siltstone) in the western and eastern portions of the Sandy area have weathered to form mostly shallow (10 to 20 inches) and moderately deep (20 to 40 inches) soils; and (3) the southern portion of the area has soils formed on wind-deposited sands. Stream channels have formed wet lands, bottomlands, and perpetually wet soils on water transported sediments.

Soil depths vary greatly from no soil on rock outcrop to greater than 60 inches on alluvium. The moderately deep and deep (40 to 60 inches) loamy and sandy loam soils that have no or few restrictive features are characterized by a luxuriant growth of shrubs and grasses. Soils with restrictive underlayers or bedrock within 20 inches of the surface have plants with stunted growth due to the limitation of root penetration or plants that require very little water to survive (xerophytes).

Varying amounts of soluble salts occur in all the soils on the Sandy area; soluble salts reach levels in some soils that affect their management potentials (reduced infiltration of water, limitation of nutrient availability, and reduction of water available to plants). Soils with high alkalinity and soluble salt content have plants that are salt-tolerant.

The amount of organic matter in the soils varies from less than 0.1% to more than 30%. This property is directly proportional to the soil's permeability (the ability of soil to allow penetration of water, gases, and roots), fertility (ability to hold nutrients in available form for plants), and available water holding capacity (the water held in soil over time by capillarity).

Major climatic factors affecting soil development are elevation, precipitation, and the pattern of snow drifts. Snow drifts affect soil development by localized increase in effective soil moisture during spring melting. The depth to limiting layers (effective rooting depth) varies with depth to lime layers (calcic horizon) and depth to bedrock (lithic contact).

Erosion by wind and water is a serious problem on some parcels of the Sandy area. Another factor that affects Sandy area soils is surface disturbance by animal hooves, by vehicles, and by ant mounds.

Inventory

A soil association (see Glossary) inventory of the Sandy area was conducted during late 1975 and early 1976 to determine the nature and extent of soil associations in the area. The locations of these associations are shown in MAP 2-3 included in Volume 3 of the FES.

The inventory was a broad reconnaissance survey (as defined by BLM Manual 7312). The information it provided is limited to use in the following planning activities: identifying areas that require a more detailed inventory, estimating erosion conditions and potentials, identifying possible areas for range or watershed improvements, and making cross-disciplinary interpretations. The survey included an estimate of the percent of a soil type within the association, but it did not locate the types. This survey cannot be a substitute for a series level survey. TABLE 2-2 gives a breakdown of the various associations and the primary vegetation types within each association for the Sandy area as well as brief characteristics of each association.

TABLE 2-3 identifies the mapping units and their area in acres for each proposed custodial pasture and allotment. APPENDIX 2A gives a description of each association and its particular characteristics; additional information is available upon request from the Rock Springs District Office. The complete soils inventory is available for review at the Rock Springs District Office.

FIGURE 2-1 BOARS TUSK AND SAND DUNES. Boars Tusk rises about 400 feet above the southern edge of the Killpecker Sand Dunes seen in the background of this photo. Both are in the Sands Allotment.

FIGURE 2-2 TYPICAL SANDY TOPOGRAPHY. This photo taken in the Little Colorado Allotment shows the nearly level land that is typical of the Sandy area.

FIGURE 2-3 OREGON BUTTES. Located in the Bush Rim Allotment, these buttes are representative of the landforms along the Continental Divide.

TABLE 2-2

SOIL INTERPRETATIVE CHARACTERISTICS FOR TOTAL SANDY AREA

Map Unit 6/	Map Unit Name 2/	Primary Vegetation Type 6/	Total Acres	Slope Range In %	Precip 3/ Zone (in/yr)	Erosion 4/ Susceptibility Class	Infiltration 5/ Rate in/hr
110	Wet alluvial	GW	10,095	0-3	7-9	Slight - Mod	1.22-1.71
111	Alkaline & saline bottoms	SW	43,275	0-3	7-9	Moderate	0.2-1.22
113	Vegetated Playas	GW	21,505	0-1	7-9	Moderate	0.5-1.5
114	Alluvial fans, sandy soils	SG	13,165	1-10	7-9	Mod - Sev	1.71
115	Fans, heavy saline soils	GW	63,375	1-6	7-9	Severe	0.2
116	Gravelly terraces	SG	12,550	0-3	7-9	Slight - Mod	0.87
117	Fans, sandy saline	SW	24,925	1-6	7-9	Moderate	0.2
119	Playas, no vegetation	NV	4,460				
121	Canyons, terrace scarps	SG	105,335	3-40	7-9	Severe	1.22-1.53
123	Residual uplands, mod deep	SG	294,055	0-6	7-9	Moderate	0.87-1.53
124	Residual uplands, shallow	SG	451,175	0-15	7-9	Mod - Sev	1.53
126	Residual uplands, saline-alkaline	SW	59,950	0-6	7-9	Mod - Sev	0.2-1.71
127	Playas, sandy soils	SG	22,120	0-1	7-9	Slight	0.9-6.0+
132	Badlands	NV	10,360	0-100	7-9	Severe	1.53
140	Dune land	NV	20,100	6-60	7-9	Severe	6.0+
141	Stabilized dunes	PF	28,705	3-30	7-9	Slight	6.0+
142	Dune & stabilized dunes	PF	26,420	3-60	7-9		6.0+
143	Stab dune & residual uplands	PF	46,260	0-6	7-9	Slight - Severe	0.2-6.0+
210	Wet alluvial	ME	4,125	0-3	10-14	Slight	1.5-1.71
211	Alkaline & saline	GR	15,360	0-3	10-14	Mod - Severe	0.36
217	Alluvial fans	SG	4,625	1-10	10-14	Mod - Severe	0.36-1.26
220	Alluvial mountain, outwash fans	SG	61,095	0-6	10-14	Slight - Mod	1.18-1.71
221	Canyons, ravines	SG	39,150	3-40	10-14	Severe	1.18-1.71
222	Residual uplands, shallow-deep	SG	74,960	3-10	10-14	Moderate	1.5-1.70
223	Fans and upland soils	SG	74,435	1-10	10-14	Mod - Severe	1.18-1.71
224	Shallow mountain tops	SG	14,045	3-30	10-14	Mod - Severe	1.18-1.71
225	Mountain outwash	SG	256,310	3-10	10-14	Mod - Severe	1.18-1.26
228	Stony glacial till	SG	27,210	6-30	10-14	Mod - Severe	1.26-1.71
233	Steep mountain. ravines	MS	65,570	10-60	10-14	Severe	1.18-1.71
310	Wet alluvial - cold	ME	3,470	0-3	15-19	Slight	1.56
320	Mountain outwash - cold	SG	22,820	3-10	15-19	Slight - Mod	1.18-1.53
328	Stony glacial till - cold	SG	12,025	6-30	15-19	Slight - Mod	1.53-1.56
333	Steep mountain - cold	MS	7,595	30-60	15-19	Severe	1.45-1.56
350	Rocky, mountain - cold	CO	59,425	10-30	15-19	Moderate	1.26-1.56
	TOTAL ACRES		2,000,050				

1/ Refer to soil map in packet on back cover of ES.
2/ Unit names derived from geomorphic setting of soil.
3/ Refers to total precipitation, except for 15-19 inch zone which is effective precipitation including drifted snowpack.
4/ Derived from "Erosion Susceptibility Classes,"BLM Manual 7317.1.
5/ Derived from "Water Intake on Midcontinental Range Lands as Influenced by Soil and Plant Cover," Technical Bulletin 1390, Agricultural Research Service and Soil Conservation Service, 1968.
6/ These soil mapping units and primary vegetation types were the basis for the soil-vegetative analysis in TABLES 2-24, 2-25, and 2-26. Vegetation abbreviations - CO - conifer; GW - greasewood; GR - grass; ME - meadow; MS - mountain shrub; NV - no vegetation; PF - perennial forb; SG - sagebrush-grass; SW - saltbush-winterfat.

TABLE 2-3
EXISTING SHEET EROSION PATES OF SOIL ASSOCIATIONS BY CUSTODIAL PASTURE AND ALLOTMENT

Custodial Pasture Number	Mapping Unit Number	Name	Acres	Geologic Erosion (Tons/Year)	Other Sheet Erosion (Tons/Year)	Total Sheet Erosion (Tons/Year)
1	140	Dune Land	261	240	1,811	2,051
2	140	Dune Land	104	95	722	817
3	333	Steep Mountain Soils N&E	150			
	217	Alluvial Fans	66			
			216	198	5,127	5,325
4	233	Steep Mountain Soils	91	84	2,282	2,366
5	110	Wet Alluvial Soils	59			
	111	Alkaline & Saline Bottoms	212			
	124	Residual Uplands	207			
			478	439	674	1,113
6	210	Wet Alluvial Soils	40			
	211	Alkaline & Saline Bottoms	291			
	222	Residual Uplands	20			
	223	Alluvial Fans & Uplands	365			
			716	657	387	1,044
7	220	Alluvial Mountain Outwash	237			
	221	Canyons & Ravines	44			
	222	Residual Uplands	249			
	333	Steep Mountain Soils N&E	41			
			571	1,704	2,206	3,910
8	210	Wet Alluvial Soils	117			
	225	Mountain Outwash	249			
	350	Rocky Mountain Soils	42			
			408	375	309	684
9	310	Wet Alluvial Soils	67			
	320	Mountain Outwash	316			
	350	Rocky Mountain Soils	290			
			673	618	789	1,407
10	320	Mountain Outwash	414			
	350	Rocky Mountain Soils	319			
			733	673	1,057	1,730
11	210	Wet Alluvial Soils	466			
	225	Mountain Outwash	450			
			916	840	306	1,146
12	310	Wet Alluvial Soils	86			
	320	Mountain Outwash	103			
			189	173	118	291
13	320	Mountain Outwash	99	91	186	277
14	320	Alluvial Mountain Outwash	24	22	3	25
15	320	Mountain Outwash	1,197			
	350	Rocky Mountain Soils	1,569			
			2,766	2,539	3,627	6,166
16	320	Mountain Outwash	150			
	350	Rocky Mountain Soils	84			
			234	215	355	570
17	123	Residual Uplands MD	506			
	222	Residual Uplands	39			
			545	500	269	814
18	220	Alluvial Mountain Outwash	259	238	8	246
19	220	Alluvial Mountain Outwash	394	362	43	405
20	220	Alluvial Mountain Outwash	54	50	6	56
21	310	Wet Alluvial Soils	725			
	320	Mountain Outwash	313			
	328	Stony Glacial Till	939			
			1,977	2,315	1,736	4,051
22	111	Alkaline & Saline Bottoms	238			
	123	Residual Uplands MD	16			
			254	33	81	114
23	110	Wet Alluvial Soils	148			
	123	Residual Uplands MD	204			
			352	23	196	219

TABLE 2-3 (Continued)
EXISTING SHEET EROSION RATES OF SOIL ASSOCIATIONS BY CUSTODIAL PASTURE AND ALLOTMENT

Custodial Pasture Number	Mapping Unit Number	Name	Acres	Geologic Erosion (Tons/Year)	Other Sheet Erosion (Tons/Year)	Total Sheet Erosion (Tons/Year)
24	110	Wet Alluvial Soils	302			
	121	Canyons & Terrace Scarps	85			
	124	Residual Upland S	1,855			
			2,242	2,058	7,219	9,277
25	220	Alluvial Mountain Outwash	3,208	2,945	359	3,304
26	328	Stony Glacial Till	1,904			
	350	Rocky Mountain Soils	725			
			2,629	2,413	5,263	7,676
27	310	Wet Alluvial Soils	391			
	328	Stony Glacial Till	568			
	350	Rocky Mountain Soils	249			
			1,208	1,109	1,255	2,364
28	210	Wet Alluvial Soils	298			
	220	Mountain Outwash	582			
			880	408	242	650
29	220	Mountain Outwash	176			
	350	Rocky Mountain Soils	586			
			762	700	530	1,230
30	220	Mountain Outwash	3,282			
	350	Rocky Mountain Soils	1,080			
			4,362	4,504	810	5,314
31	110	Wet Alluvial Soils	1,149			
	117	Alluvial Fans SS	536			
			1,685	547	101	648
32	110	Wet Alluvial Soils	220	2	11	13
33	110	Wet Alluvial Soils	88	1	4	5
	TOTAL CUSTODIAL PASTURES		29,598	27,171	38,137	65,308
Allotment						
Bar X	210	Wet Alluvial Soils	574			
	221	Canyons and Ravines	204			
	222	Residual Uplands	98			
	223	Alluvial Fans & RU	4,308			
	225	Mountain Outwash Soils	1,711			
			6,895	6,330	8,396	14,726
Fish Creek	210	Wet Alluvial Soils	142			
	225	Mountain Outwash Soils	7,095			
			7,237	6,643	10,126	16,769
Gold Creek	210	Wet Alluvial Soils	140			
	225	Mountain Outwash Soils	1,972			
	310	Wet Alluvial Soils	581			
	320	Mountain Outwash Soils	6,710			
	350	Rocky Mountain Soils	21,122			
			30,525	28,023	33,276	61,299
Little Sandy-Little Prospect	110	Wet Alluvial Soils	1,045			
	111	Alkaline and Saline Soils	981			
	114	Alluvial Fans, S	1,484			
	119	Playas	972			
	121	Canyons & Scarps	814			
	123	Residual Uplands, MD	37,140			
	124	Residual Uplands, SH	36,742			
	126	Residual Uplands, AS	3,699			
	127	Playas & Sandy Soils	5,552			
	143	Stabilized Dunes & RU	3,688			
	211	Alkaline and Saline Soils	3,280			
	220	Mountain, Outwash Fans	18,102			
	221	Canyons & Ravines	5,665			
	222	Residual Uplands	17,754			
	223	Alluvial Fans & RU	320			
	228	Stony, Glacial Till	20,530			
	233	Steep Mountain Soils	1,654			
	320	Mountain, Outwash	6,034			
	328	Stony, Blacial Till	3,217			
	333	Steep Mountain Soils	1,635			
	350	Rocky, Mountain Soils	15,352			
			185,660	168,437	475,152	643,589

TABLE 2-3 (Continued)

EXISTING SHEET EROSION RATES OF SOIL ASSOCIATIONS BY CUSTODIAL PASTURE AND ALLOTMENT

Allotment	Mapping Unit Number	Name	Acres	Geologic Erosion (Tons/Year)	Other Sheet Erosion (Tons/Year)	Total Sheet Erosion (Tons/Year)
Steamboat Mountain	115	Alluvial Fans, HS	1,537			
	121	Canyons & Scarps	766			
	211	Alkaline & Saline Soils	156			
	217	Alluvial Fans	4,063			
	221	Canyons & Ravines	2,109			
	223	Alluvial Fans & RU	8,851			
	233	Steep Mountain Soils	18,149			
	333	Steep Mountain Soils	4,906			
			40,537	37,213	648,111	685,324
Little Colorado: Green River Use Area	110	Wet Alluvial Soils	2,084			
	111	Alkaline & Saline Soils	6,442			
	114	Alluvial Fans, S	1,506			
	116	Gravelly Terrace Soils	11,861			
	117	Alluvial Fans, SS	8,271			
	121	Canyons & Scarps	71,517			
	123	Residual Uplands, MD	76,176			
	124	Residual Uplands, SH	104,699			
	126	Residual Uplands, AS	14,729			
	127	Playas and Sandy Soils	6,336			
	132	Badlands	170			
			303,791	278,881	451,231	730,112
Farson Use Area	111	Alkaline & Saline Soils	3,774			
	113	Playas, Vegetated	18,506			
	114	Alluvial Fans, S	2,216			
	117	Alluvial Fans, SS	1,907			
	119	Playas	71			
	121	Canyons & Scarps	9,677			
	123	Residual Uplands, MD	28,620			
	124	Residual Uplands, SH	121,715			
	126	Residual Uplands, AS	12,261			
	132	Badlands	1,863			
	143	Residual Uplands, SD	4,513			
			205,123	188,302	533,159	721,461
Big Sandy Use Area	110	Wet Alluvial Soils	964			
	111	Alkaline & Saline Soils	9,259			
	113	Playas, Vegetated	2,792			
	114	Alluvial Fans, S	3,719			
	116	Gravelly Terrace Soils	4,503			
	119	Playas	343			
	121	Canyons & Scarps	8,217			
	123	Residual Uplands, MD	32,311			
	124	Residual Uplands, SH	125,432			
	126	Residual Uplands, AS	11,085			
	127	Playas & Sandy Soils	1,446			
	132	Badlands	162			
	143	Residual Uplands, SD	17,809			
			218,042	200,163	518,492	718,655
Red Desert	111	Alkaline & Saline Soils	17,812			
	113	Playas, Vegetated	5,315			
	114	Alluvial Fans, S	2,052			
	115	Alluvial Fans, HS	57,058			
	119	Playas	7,133			
	121	Canyons & Scarps	16,910			
	123	Residual Uplands, MD	64,283			
	124	Residual Uplands, SH	8,226			
	126	Residual Uplands, AS	4,018			
	127	Playas & Sandy Soils	9,666			
	132	Badlands	6,089			
	141	Stabilizing Dunes	2,599			
	142	Dune Lands & SD	20,534			
	143	Residual Uplands, SD	16,448			
	217	Alluvial Fans	31			
	223	Alluvial Fans & RU	3,375			
	233	Steep Mountain Soils	3,826			
			245,375	225,254	408,831	634,085

TABLE 2-3 (Continued)
EXISTING SHEET EROSION RATES OF SOIL ASSOCIATIONS BY CUSTODIAL PASTURE AND ALLOTMENT

Allotment	Mapping Unit Number	Name	Acres	Geologic Erosion (Tons/Year)	Other Sheet Erosion (Tons/Year)	Total Sheet Erosion (Tons/Year)
Bush Rim	111	Alkaline & Saline Soils	1,895			
	113	Playas, Vegetated	239			
	114	Alluvial Fans, S	203			
	115	Alluvial Fans, HS	3,410			
	117	Alluvial Fans, SS	11,046			
	121	Canyons & Scarps	1,614			
	123	Residual Uplands, MD	19,578			
	124	Residual Uplands, SH	4,668			
	132	Badlands	357			
	143	Residual Uplands, SD	9,078			
	210	Wet Alluvial Soils	179			
	211	Alkaline & Saline Soils	1,016			
	217	Alluvial Fans	941			
	221	Canyons & Ravines	4,974			
	222	Residual Uplands	367			
	223	Alluvial Fans & RU	20,551			
	233	Steep Mountain Soils	24,431			
			104,547	95,974	703,668	799,642
Continental Peak	115	Alluvial Fans, HS	10,736			
	117	Alluvial Fans, SS	498			
	121	Canyons & Scarps	4,651			
	123	Residual Uplands, MD	3,680			
	124	Residual Uplands, SH	6,552			
	132	Badlands	2,487			
	210	Wet Alluvial Soils	159			
	211	Alkaline & Saline Soils	828			
	221	Canyons & Ravines	2,201			
	222	Residual Uplands	33,328			
	223	Alluvial Fans & RU	14,473			
	233	Steep Mountain Soils	8,161			
	333	Steep Mountain Soils	724			
			88,478	81,223	560,039	641,262
Pacific Creek	110	Wet Alluvial Soils	1,110			
	111	Alkaline & Saline Soils	4,193			
	114	Alluvial Fans, SS	156			
	121	Canyons & Scarps	471			
	123	Residual Uplands, MD	28,413			
	124	Residual Uplands, SH	22,673			
	126	Residual Uplands, AS	12,051			
	140	Dune Lands	1,143			
	141	Stabilized Dunes	10,852			
	142	Dune Lands & SD	2,750			
	143	Residual Uplands, SD	2,560			
	210	Wet Alluvial Soils	1,119			
	211	Alkaline & Saline Soils	8,312			
	217	Alluvial Fans	733			
	220	Mountain Outwash Fans	5,782			
	221	Canyons & Ravines	21,121			
	222	Residual Uplands	24,776			
	223	Alluvial Fans & RU	24,839			
	225	Mountain Outwash Soils	389			
	233	Steep Mountain Soils	28,966			
	333	Steep Mountain Soils	447			
			202,856	186,223	1,235,860	1,422,083
Sands	114	Alluvial Fans, S	2,174			
	117	Alluvial Fans, SS	4,435			
	121	Canyons & Scarps	1,222			
	123	Residual Uplands, MD	13,540			
	124	Residual Uplands, SH	7,438			
	126	Residual Uplands, AS	1,622			
	127	Playas and Sandy Soils	3,015			
	140	Dune Land	21,665			
	141	Stabilized Dunes	19,965			
	142	Dune Land & SD	14,264			
	143	Residual Uplands, SD	5,788			
	221	Canyons & Ravines	643			
	224	Mountain Top Soils	15,385			
	233	Steep Mountain Soils	3,696			
			114,852	105,434	435,750	541,184

TABLE 2-3 (Continued)
EXISTING SHEET EROSION RATES OF SOIL ASSOCIATIONS BY CUSTODIAL PASTURE AND ALLOTMENT

Allotment	Mapping Unit Number	Name	Acres	Geologic Erosion (Tons/Year)	Other Sheet Erosion (Tons/Year)	Total Sheet Erosion (Tons/Year)
White Acorn	124	Residual Uplands, SH	308			
	220	Mountain, Outwash Fas	7,214			
	221	Canyons & Ravines	2,626			
	222	Residual Uplands	12,090			
	224	Mountain Top Soils	52			
	225	Mountain Outwash Soils	5,694			
	228	Stony, Glacial Till	552			
	310	Wet Alluvial Soils	584			
	320	Mountain Outwash Soils	9,597			
	350	Rocky, Mountain Soils	8,077			
			46,794	42,956	134,187	177,143
Prospect Mountain	110	Wet Alluvial Soils	453			
	111	Alkaline & Saline Soils	458			
	121	Canyons & Scarps	887			
	123	Residual Uplands, MD	6,018			
	124	Residual Uplands, SH	6,164			
	132	Badlands	311			
	210	Wet Alluvial Soils	2,038			
	211	Alkaline & Saline Soils	280			
	220	Mountain, Outwash Fans	11,316			
	221	Canyons and Ravines	3,559			
	222	Residual Uplands	8,109			
	223	Alluvial Fans & RU	213			
	228	Stony, Glacial Till	10,727			
	233	Steep Mountain Soils	404			
	310	Wet Alluvial Soils	390			
	328	Stony, Glacial Till	10,914			
	333	Steep Mountain Soils	314			
	350	Rocky, Mountain Soils	4,196			
			66,751	61,276	175,552	236,828
Reservoir	110	Wet Alluvial Soils	664			
	111	Alkaline & Saline Soils	1,325			
	117	Alluvial Fans, SS	486			
	121	Canyons & Scarps	301			
	123	Residual Uplands, MD	12,014			
	124	Residual Uplands, SH	16,289			
	126	Residual Uplands, AS	4,466			
			35,545	32,631	72,100	104,731
Poston	110	Wet Alluvial Soils	703			
	121	Canyons & Scarps	777			
	123	Residual Uplands, MD	11,211			
	124	Residual Uplands, SH	35,828			
	126	Residual Uplands, AS	1,877			
	132	Badlands	239			
			50,635	46,483	151,526	198,009
Pine Creek	225	Mountain Outwash Soils	9,756			
	310	Wet Alluvial Soils	5			
	320	Mountain Outwash Soils	927			
	350	Rocky, Mountain Soils	3,401			
			14,089	12,934	18,774	31,708
		TOTALS	1,967,732	1,804,380	6,574,230	8,378,610
		GRAND TOTAL 1/	1,997,330	1,831,551	6,612,367	8,443,918

Abbreviations - RU-Residual Uplands, MD-Moderately Deep Soils, SH-Shallow Soils, AS-Alkaline-Saline Soils, HS-Heavy Saline Soils, S-Sandy Soils, SS-Sandy Saline Soils, SD-Stabilized Dunes

1/Does not include Palmer Draw no grazing area and Federal withdrawals.

8,378,610

Sheet Erosion

Estimates of the current amount of sheet erosion for each allotment and custodial pasture are located in TABLE 2-3. Sheet erosion rates were prepared using a formula developed by G.W. Musgrave. APPENDIX 2B explains how the Musgrave Equation was used.

Sheet erosion is the loss of a uniform layer of land surface due to runoff water (Soil Science Society 1975). The rate of loss in tons per acre per year was calculated for each mapping unit (APPENDIX 2B).

Geologic erosion, or the wearing away of the land surface by natural factors under natural environmental conditions over which man has little or no influence (Soil Science Society 1975), is occurring at an estimated average rate of 0.92 tons per acre per year in the Sandy area. These rates are listed by allotment and custodial pasture in TABLE 2-3.

These results indicate that the Sandy area has a highly erosive environment. The nature and permeability of the soil, combined with high winds and low amounts of vegetal cover, contribute to this erosive nature. Mapping Units 132, 233, and 333 show very high erosion rates due to lack of ground cover and steep slopes.

The current geologic erosion rate of the Sandy area is 5.6 inches per thousand years, which is two to five times the average rate for the continental United States (Hunt 1975) and corresponds to the estimated rate for the Colorado River Basin. Data was derived from long-term studies of sediment loads in the streams that drain the basin (Hunt 1975).

The Soil Conservation Service (1973) maximum acceptable soil loss for a deep soil (greater than 60 inches) capable of regenerating itself is 5 tons per acre per year; for a very shallow soil (less than 10 inches), 1 ton; and a shallow soil (less than 20 inches), 2 tons. Using this as a general guide and with the knowledge that most of the soils in the Sandy area are shallow, it would be possible to place the Sandy area pastures into three broad classes: (1) lightly eroding within tolerable limits—less than 2 tons per year; (2) moderately eroding somewhat outside tolerable limits—2 to 5 tons per year; and (3) excessively eroding beyond tolerable limits— greater than 5 tons per year (TABLE 2-4).

Wind Erosion

The wind erosion potential in the Sandy area varies greatly with soil type. TABLE 2-5 gives weighted average wind erosion potential ranges for bare soil on the soil mapping units. This table was derived from information in the Soil Conservation Service's *Handbook for Interpretations*. APPENDIX 2C has a detailed description of soil and wind erodibility.

Wind erosion is a potentially serious hazard in dune land and/or stabilized dune soil associations (Mapping Units 140, 141, 142, and 143) with wind erosion potential rates up to 340 tons per acre per year (TABLE 2-5). Studies have not been conducted to determine the actual amount of wind erosion, and it cannot be quantified at this time.

Surface Disturbance

Surface disturbance of soils on the Sandy area is occurring wherever there is use by wildlife, livestock, and man. This disturbance goes unnoticed until use of the land becomes concentrated or intensive. In areas of concentrated use, the soil's surface structure has been broken down. The breakdown in surface structure has resulted in decreased infiltration and an increase in the sheet erosion potential. Also, increased surface area has resulted in an increase in wind erosion potential and surface evaporation loss of soil moisture.

Using known water sources and licensed use, the acres of livestock concentration were estimated by using a formula developed by Walter F. Mueggler (1965). TABLE 2-6 lists the estimated acres of each allotment under degrees of livestock use. Use of the Mueggler Equation is shown in APPENDIX 2D. Current trampling is expected to inhibit soil production on 4% of the grazing management area, or 69,061 acres.

Soil Compaction

Soil compaction is an undesirable result of grazing livestock. In his review of literature, Orr (1975) found: "...compaction significantly restricts infiltration and perculation. It must follow, then, that overland runoff is greater from compacted than from uncompacted soils. Thus, soil compaction is undesirable in practically all respects in the wild land, economic, or pasture setting, and soil recovery potential must be an important consideration in land management" Orr cites Lull's comprehensive review of soil compaction (1959), emphasizing "...that results of past studies of causative agents of compaction have produced highly variable but seldom contradicting results" Orr concluded that "...exclusion of livestock trampling from heavily grazed bluegrass range resulted in measurable soil responses...in the second growing season after fencing" However, he also noted that "...protection from grazing and trampling resulted in less summer storm runoff in the first growing season (fenced the previous fall) and also in each of the following three years" Less runoff indicates more infiltration and, thus, more water availability for plant production during the growing season.

The general trend among livestock operators is away from sheep grazing and toward cattle grazing. Sheep traditionally have been grazed in the more mountainous areas during summer and the more arid areas during the winter. Winter grazing does not generally damage the soil as frozen soil is not readily compacted. The generally accepted and stated conclusion is that grazing is most harmful during wet periods. For the Sandy area, this would be during the spring when winter snows are melting, the ground is no longer frozen, and spring showers are occurring. Grazing during this period destroys sur-

TABLE 2-4

ACRES OF EROSION CLASSES BY ALLOTMENT

Allotment	Light*	Moderate*	Excessive*
Bar X	4,771	2,124	
Fish Creek		7,237	
Gold Creek	15,253	15,272	
Little Sandy-Little Prospect		185,660	
Steamboat Mountain			40,537
Little Colorado:			
Green River Use Area	84.513	219,278	
Farson Use Area		205,123	
Big Sandy Use Area		218,042	
Red Desert		245,375	
Bush Rim		32,533	72,014
Continental Peak			88,478
Pacific Creek		68,457	134,399
Sands		38,694	76,158
White Acorn		38,746	8,048
Prospect Mountain		66,751	
Reservoir	10,932	24,613	
Poston	14,864	35,771	
Pine Creek		14,089	
TOTALS	130,333	1,417,765	419,634

* Light-less than 2 tons per year; Moderate-2 to 5 tons per year; Excessive-Greater than 5 tons per year.

TABLE 2-5

WEIGHTED AVERAGE WIND EROSION POTENTIAL
FOR SOIL ASSOCIATIONS IN THE SANDY AREA

Mapping Unit (Soil Assoc.)	Acres	Wind Erosion Group*	Wind Erosion Potential (tons/acre/year)	Total Average Wind Erosion Potential (tons/year)
110	10,095	-	0	0
111	43,275	4L	0-180	3,894,750
113	21,505	6	65-117	1,965,955
114	13,165	3	65-117	1,198,015
115	63,375	4L	67-180	7,826,813
116	12,550	4L	67-180	1,549,925
117	24,925	3	117-180	3,701,363
119	4,460	--	0	0
121	105,335	4L	0-117	6,162,098
123	294,055	3	29-180	30,728,747
124	451,175	4L	0-180	40,605,750
126	59,950	3	113-180	8,782,675
127	22,120	1	0-340	3,760,400
132	10,360	3	0-63	326,340
140	20,100	--	280-340	6,231,000
141	28,705	1	280-340	8,898,550
142	26,420	--	280-340	8,190,200
143	46,260	3	65-340	9,367,650
210	4,125	8	0	0
211	15,360	8	0-79	606,720
217	4,625	4L	67-180	571,188
220	61,095	4	67-180	7,545,233
221	39,150	4L	0-180	3,523,500
222	74,960	4L	33-180	7,983,240
223	74,435	3	65-180	9,118,288
224	14,045	3	67-180	1,734,558
225	256,310	5	0-180	23,067,900
228	27,210	5	33-117	2,040,750
233	65,570	4L	0-180	5,901,300
310	3,470	8	0-63	109,305
320	22,820	5	33-79	1,277,920
328	12,025	6	33-117	901,875
333	7,595	6	0-117	444,308
350	59,425	6	0-117	3,476,363
TOTALS	2,000,050			

*See APPENDIX 2C for description.

TABLE 2-6

ESTIMATED ACRES OF GRAZING INTENSITY BY LIVESTOCK
ADJUSTED TO PROPOSED ACTION BOUNDARIES*

Allotment	Slight To Marginal[x]	Light[x]	Moderate[x]	Heavy[x]	Severe[x]	Total Acres
Bar X	415	3,949	1,687	546	298	6,895
Fish Creek	0	4,773	1,815	466	183	7,237
Gold Creek	332	18,352	8,894	2,158	789	30,525
Little Sandy-Little Prospect	41,581	96,351	35,248	8,978	3,502	185,660
Steamboat Mountain	20,396	16,868	2,553	555	165	40,537
Little Colorado: Green River Use Area	219,361	57,286	18,564	6,593	1,987	303,791
Farson Use Area	102,762	69,453	22,506	7,993	2,409	205,123
Big Sandy Use Area	107,751	74,833	24,250	8,612	2,596	218,042
Red Desert	229,821	13,324	1,749	341	140	245,375
Bush Rim	85,318	16,397	2,107	532	193	104,547
Continental Peak	39,317	39,226	7,396	1,842	697	88,478
Pacific Creek	95,826	92,326	10,975	2,712	1,017	202,856
Sands	69,977	36,352	6,531	1,534	458	114,852
White Acorn	11,176	26,929	6,328	1,806	555	46,794
Prospect Mountain	5,836	45,128	11,765	2,921	1,101	66,751
Reservoir	5,244	23,092	5,127	1,440	642	35,545
Poston	11,076	29,801	7,011	2,105	642	50,635
Pine Creek	3,170	8,568	1,798	391	162	14,089
TOTAL	1,049,359	673,008	176,304	51,525	17,536	1,967,732

x - Slight to Marginal-Greater than 75 acres/AUM; Light-16 to 75 acres/AUM; Moderate-5.5 to 16 acres/AUM; Heavy-2 to 5.5 acres/AUM; Severe-Less than 2 acres/AUM.

* Details on how adjustment was made are available upon request from the Rock Springs District Office.

face structure, eliminates both micro-and macropore space, and pushes plants into the ground. The surface becomes hard, crusted, and platy (see Glossary). Water infiltration can be reduced by as much as half and runoff doubled (Agricultural Research Service and Soil Conservation Service 1968). Therefore, it is important to determine where compaction on the range is occurring and the approximate acreage involved.

Mueggler (1965) has provided a vehicle for determining how far cattle will go from water under varying slope conditions and also the relative degree of use (APPENDIX 2D). This equation is directly applicable to the Northern Rocky Mountain foothill areas and is used here because the same general relationships hold true. However, no studies of this nature have been conducted on high desert ecosystems to date and differences not accounted for by his equation may exist. Since the trend in the Sandy area is toward cattle grazing, all livestock AUMs were considered as cattle use. Cattle congregate more closely around water than do sheep (sheep are regularly herded and grazed from one waterhole to another while cattle are not). It is therefore possible to use the existing water developments (MAP 2-4, included in Volume 3 of the FES) and topographic maps to determine the areas cattle would graze. These maps are available for review in the Rock Springs District Office. It is recognized that some of these waters would not last the grazing season and that watering facilities recently completed would not be identified. A grazing pressure of at least 5 acres per AUM would have to be applied before any appreciable degree of compaction could be expected. This pressure would include the severe and heavy grazing intensities identified in TABLE 2-6. APPENDIX 2D includes the method used in calculating the livestock grazing intensities.

The following groupings represent the relative intensity of use for concentrations of livestock in the Sandy area; they are the best estimates of BLM range conservationists in the Rock Springs District:

1. Severe is less than 2 acres per AUM.
2. Heavy is 2 to 5.5 acres per AUM.
3. Moderate is 5.5 to 16 acres per AUM.
4. Light is 16 to 75 acres per AUM.
5. Slight is greater than 75 acres per AUM.
6. Marginal is that area too distant from water to be used except in the winter and spring when water is trapped in shallow depressions.

Representative soils in the Sandy area are shown in FIGURES 2-4, 2-5, and 2-6.

WATER RESOURCES

Water Use

Total consumptive water use by the major wildlife species and wild horses in the Sandy area is estimated to be 10,963,808 gallons per year (33.6 acre-feet per year), not including evaporation losses. Livestock consume an estimated 25,831,500 gallons per year (79.2 acre-feet per year). Consumptive water requirements are shown on TABLE 2-7.

Because of vast areas without perennial surface water, stock reservoirs are relied upon in many areas of the Sandy by livestock, wild horses, and wildlife. The 299 reservoirs, 113 springs, and 111 wells existing in the area are shown by allotment in TABLE 2-8 and on MAP 2-4. The total evaporation loss from the stock reservoirs and pits is estimated to be 876 acre-feet per year (APPENDIX 2E). The estimate is based on an average reservoir size and a net evaporation loss of 40 inches per year (Smith 1974). Only one-half of the 299 reservoirs actually hold water, storing an estimated 880 acre-feet per year.

Water is used for irrigation on the Eden Irrigation Project and on private lands upstream of the Sandy area.

Several Wyoming municipalities downstream from the Sandy area use Green River water for drinking, including Rock Springs and Green River. Green River water is also used by Jim Bridger Power Plant, Stauffer Chemical Company, Texasgulf, Inc., and other industries.

Three municipalities—Pinedale, LaBarge, and Big Piney--discharge waste water into the Green River above the Sandy area (DEQ 1976).

Streamflow

Seventy-five percent of the Sandy area drains into the Green River, 17% into the Great Divide Basin, and 8% into the Sweetwater River Basin (MAP 2-5). The Green River is a major tributary of the Colorado River; the Great Divide Basin is topographically closed; and the Sweetwater River is a tributary of the North Platte River.

Most of the perennial streams in the area originate in the Wind River Mountains north of the Sandy area, where the greatest precipitation occurs and where ground water inflows sustain base flows. The major perennial streams are the Big Sandy (111 miles), Little Sandy (69 miles), Green (35 miles), and Sweetwater Rivers (31 miles). The major part of annual runoff for these streams occurs during spring and early summer as a result of snowmelt. Late summer, fall, and winter flows are mainly the result of ground water inflow (FIGURE 2-7).

Streams originating in the plains area are ephemeral or intermittent. They flow mainly in response to direct runoff from rainstorms and snowmelt (FIGURE 2-8).

The United States Geological Survey (USGS) operates several streamflow and water quality sampling stations in the Sandy area (MAP 2-5 located at the end of this chapter). Records show that annual precipitation and runoff in the Sandy area have varied as much as 30% from the long-term average (FIGURE 2-9).

Water Quality

Solute concentrations of the major inorganic constituents in the Big Sandy and Little Sandy Rivers increase significantly in the downstram direction as shown in

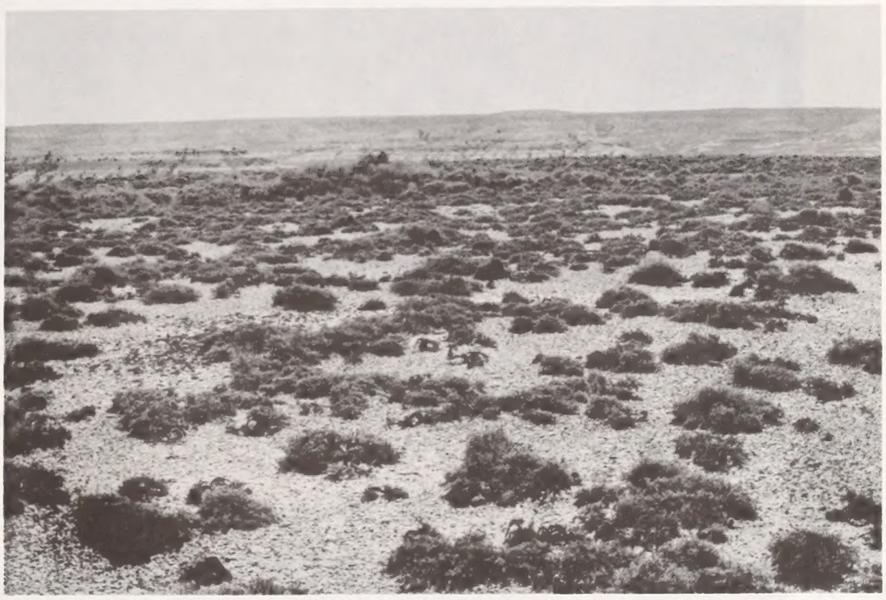


FIGURE 2-4 SHALLOW UPLAND SOIL. This photo shows Mapping Unit 121 soil in the Little Colorado Allotment. These soils are not developed enough to support the fibrous-rooted plants that produce better forage.

FIGURE 2-5 MAPPING UNIT 132 A low production, shallow soil in the Red Desert Allotment is shown above. This unit is not protected from erosion because it is nearly bare of vegetation.

FIGURE 2-6 MAPPING UNIT 210. This photo shows a typical high production, deep soil in the Bar X Allotment. These soils are able to support the desirable fibrous-rooted grasses and sedges.

TABLE 2-7

CONSUMPTIVE WATER REQUIREMENTS OF MAJOR WILDLIFE SPECIES, WILD HORSES, AND LIVESTOCK

Animal	Animal Months/Year	Gallons Per Animal Month 1/	Total Gallons Required/Year
Elk	13,464 2/	120	1,615,680
Moose	782 2/	250 3/	195,500
Deer	57,412 2/	24	1,377,888
Antelope	114,636 2/	15	1,719,540
Wild Horses	20,184 4/	300	6,055,200
Livestock	86,105 5/	300	25,831,500
		TOTAL	36,795,308
			(112.9 acre-feet/year)

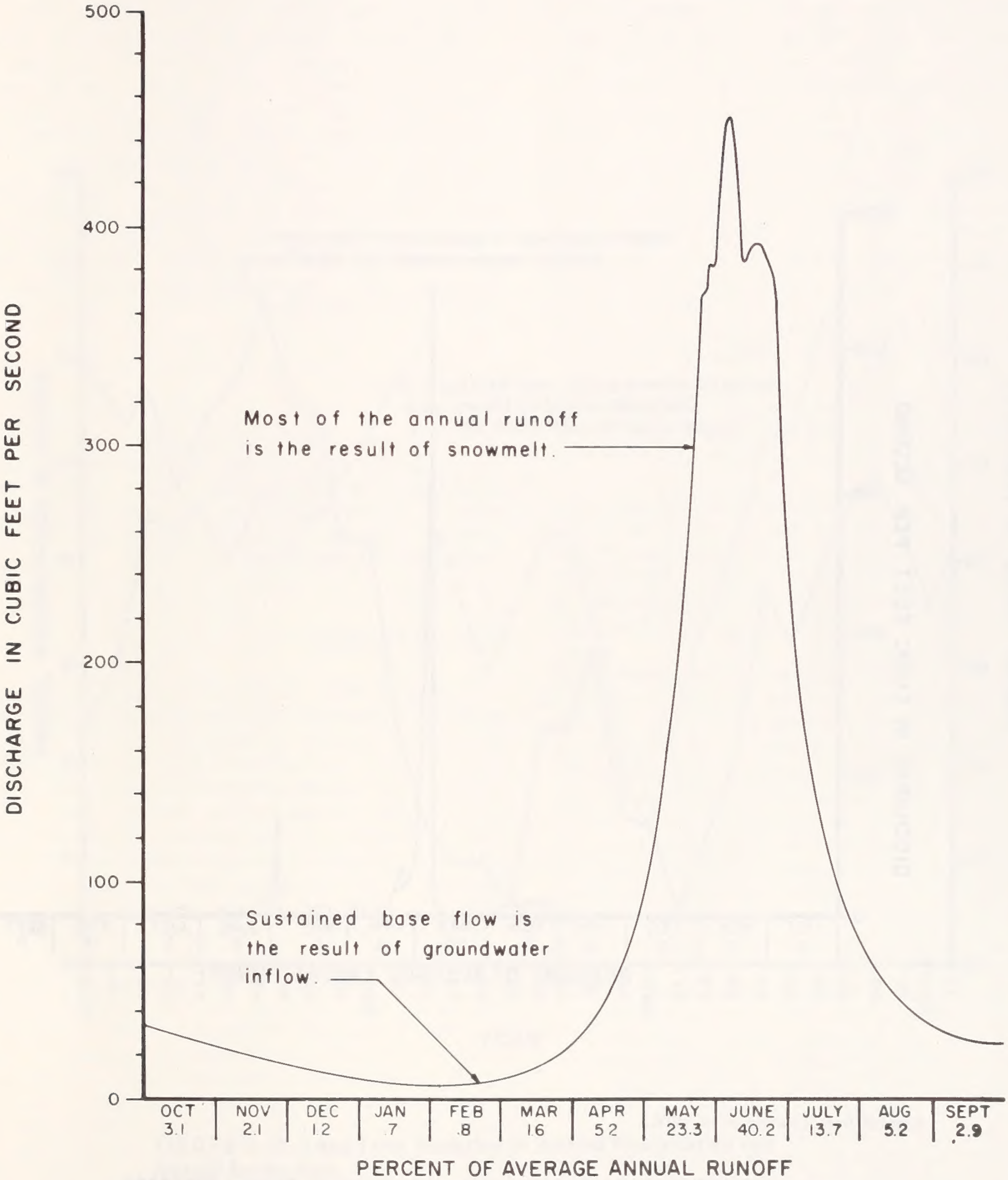
1/ BLM Manual 1605, Illustration 12.
2/ From TABLE 2-36.
3/ Consumptive requirements for moose are estimated.
4/ From TABLE 2-58: Number of horses (1,682) x 12 months = 20,184 animal months.
5/ From TABLE 2-70: Includes cattle, sheep, and domestic horses where 1 AUM = 1 animal month.

TABLE 2-8

EXISTING WATER DEVELOPMENTS[1/]

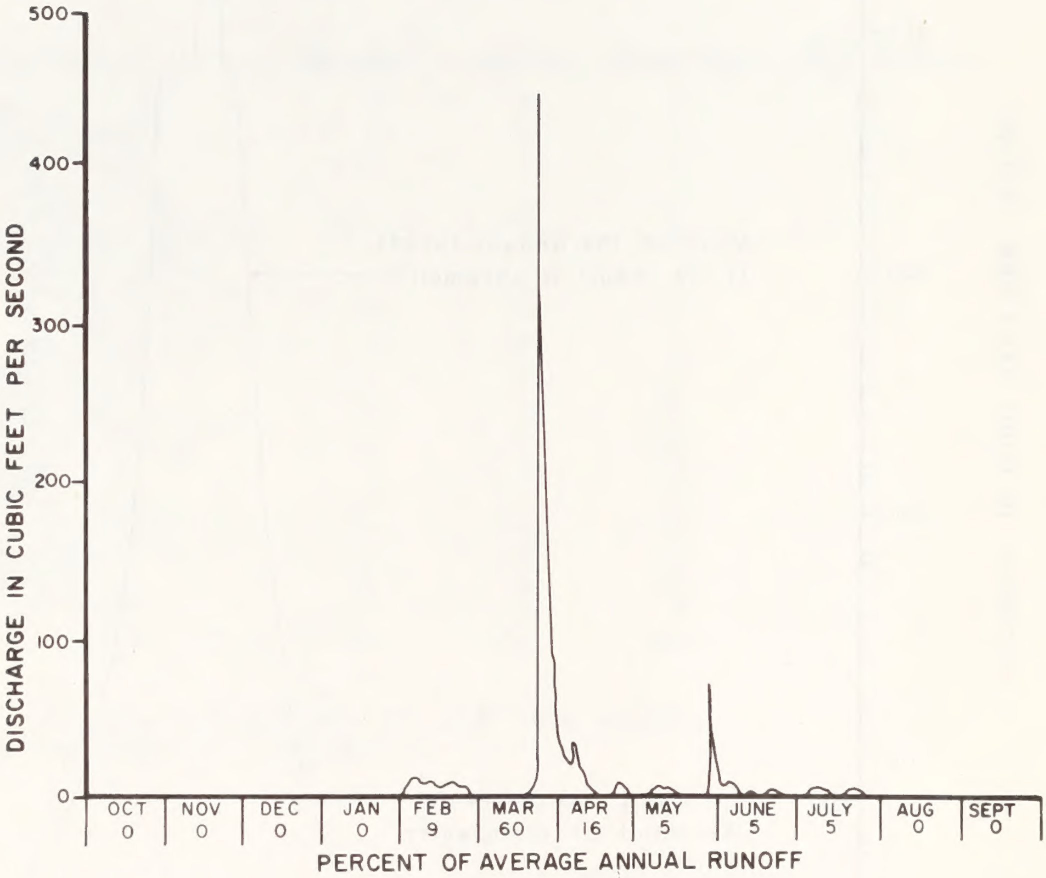
Allotment	Springs[2/]	Wells	Reservoirs	Windmills
Bar X	0	0	0	0
Fish Creek	0	0	3	0
Gold Creek	8	2	0	0
Little Sandy- Little Prospect	13	8	46	0
Steamboat Mountain	13	2	11	0
Little Colorado:				
Green River Use Area	1	23	4	0
Farson Use Area	3	17	11	0
Big Sandy Use Area	0	23	8	0
Red Desert	3	11	6	1
Bush Rim	17	5	34	0
Continental Peak	7	2	14	0
Pacific Creek	23	9	102	0
Sands	9	5	5	0
White Acorn	3	0	11	0
Prospect Mountain	11	4	21	0
Reservoir	0	0	5	0
Poston	1	0	18	0
Pine Creek	1	0	0	0
TOTALS	113	111	299	1

1/ Includes unfenced private and state waters.
2/ Includes developed springs.



Adapted from Lowham et. al. 1976

FIGURE 2 - 7 Typical Perennial Hydrograph. Station 09212500 Big Sandy River at Leckie Ranch, Near Big Sandy, Wyoming (1940 - 1972 Water Years).



Adapted from Lowham et. al. 1976

FIGURE 2 - 8 Typical Intermittent Hydrograph. Station 09215000 Pacific Creek Near Farson (1971 Water Year).

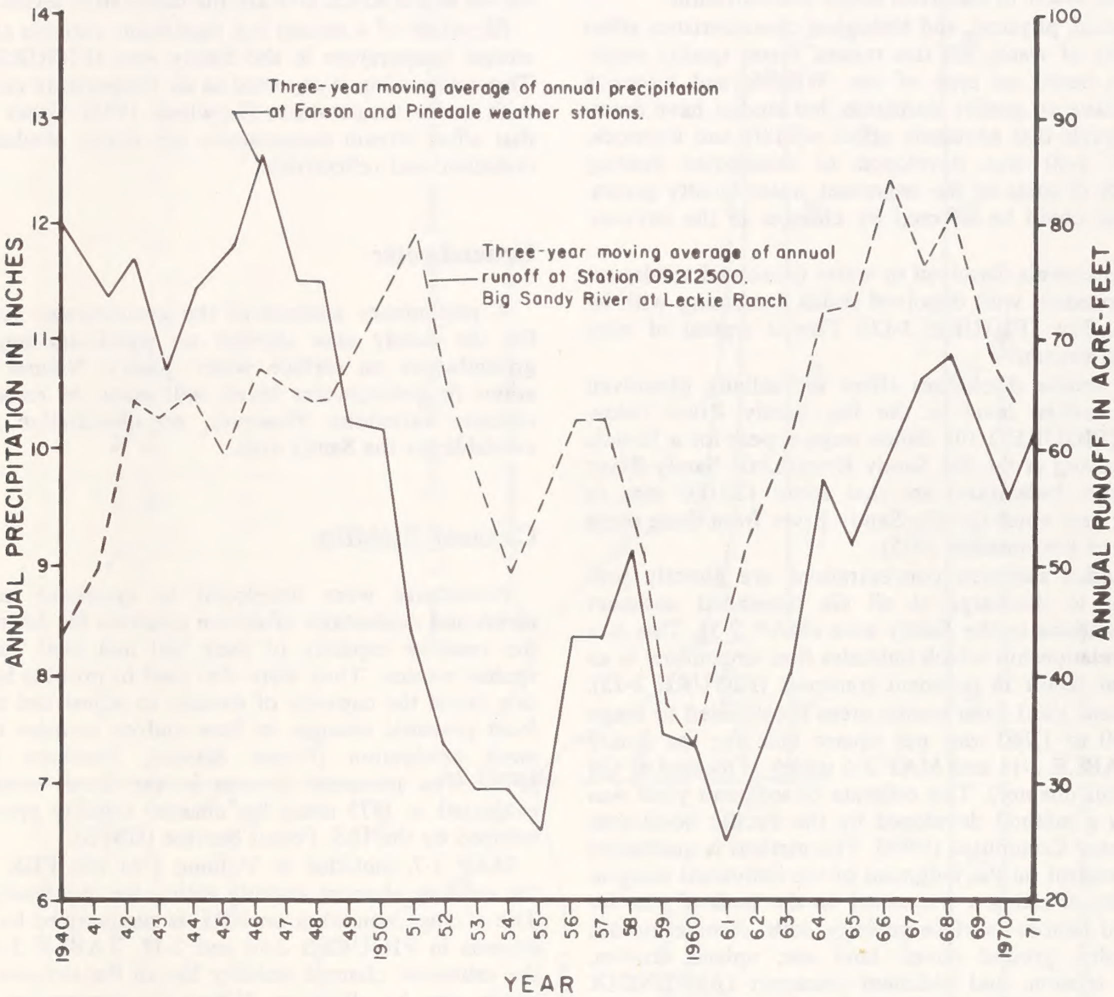


FIGURE 2-9 Long-Term Variation in Annual Precipitation and Runoff-Sandy Area.

FIGURE 2-10. This increase has a significant effect on water quality of the Green River (FIGURE 2-11). Notable change in water type (type of ions dissolved) parallels the increasing solute concentrations. A difference in mean sample dissolved solid concentration from less than 250 milligrams per liter (mg/l) on the Green River to greater than 2,700 mg/l (TABLE 2-9) on the Big Sandy is accompanied by increases in the ratios of sulfate (SO_4) to bicarbonate (HCO_3) and sodium (Na) to calcium (Ca) ions. Water in the Green River near LaBarge is similar in type to water in the upper reaches of the Big Sandy River but lower in dissolved solids concentration.

Chemical, physical, and biological characteristics affect the utility of water; for this reason, water quality standards are based on type of use. Wildlife and livestock waters have no quality standards, but studies have determined levels that adversely affect wildlife and livestock. TABLE 2-10 was developed to summarize existing standards of some of the important water quality parameters that could be affected by changes in the environment.

The chemicals dissolved in water (dissolved solids) are flow dependent with dissolved solids decreasing with increasing flow (FIGURE 2-12). This is typical of most perennial streams.

Point source discharges affect the salinity (dissolved salts or solids) level in the Big Sandy River below Farson (FIGURE 2-10). Saline seeps appear for a 16-mile reach starting at the Big Sandy River-Little Sandy River confluence. Indications are that about 120,000 tons of salts per year enter the Big Sandy River from these seeps (Bureau of Reclamation 1975).

Suspended sediment concentrations are directly proportional to discharge at all six suspended sediment gaging stations in the Sandy area (MAP 2-5). This is a typical relationship which indicates that streamflow is an important factor in sediment transport (FIGURE 2-13).

Sediment yield from source areas is estimated to range from 450 to 1,260 tons per square mile for the Sandy area (TABLE 2-11 and MAP 2-6 which is located at the end of this chapter). This estimate of sediment yield was made by a method developed by the Pacific Southwest Interagency Committee (1968). The method is qualitative and dependent on the judgment of the individual using it. It consists of rating a watershed on the basis of nine interrelated factors—surface geology, soils, climate, runoff, topography, ground cover, land use, upland erosion, channel erosion, and sediment transport (APPENDIX 2F). A numerical rating for each subbasin is computed by summing the rated values for each factor. The summed rating is then used to determine an estimated sediment yield for the subbasin. Although this method was originally developed for use on large river basins, Shown (1970) demonstrated the method to be applicable to small watersheds.

Numerous existing stock pond reservoirs in the Sandy area have an effect on basin sediment yield in that they retain sediment until the reservoir is filled or the dam is breached. This is only a temporary interruption in the overall erosion cycle as sediment yield will begin once the dam is breached.

Few bacteria are adverse to man's welfare, insofar as water quality is concerned. The major emphasis is on pathogenic bacteria. Fecal coliform bacteria are used to indicate the possible presence of pathogenic bacteria. FIGURE 2-14 shows the correlation between stream discharge and fecal coliform levels in the Green River.

Fecal coliform bacteria are deposited in the feces of warm-blooded animals. When feces are deposited near streams, fecal coliform can be carried into the streams with runoff waters. Fecal coliform can also enter the stream with waste waters. The fecal coliform levels shown in FIGURE 2-14 are the cumulative levels.

Elevation of a stream is a significant variable affecting stream temperature in the Sandy area (FIGURE 2-15). This relationship is expected as air temperature correlates with water temperatures (Lowham 1976). Other factors that affect stream temperatures are stream shading, heat radiation, and reflectivity.

Groundwater

A preliminary analysis of the groundwater resources for the Sandy area showed no significant impact of groundwater on surface water quality. Natural fluctuations in groundwater levels will occur in response to climatic variations. However, no quantitative data is available for the Sandy area.

Channel Stability

Procedures were developed to systemize measurements and evaluations of stream channels for determining the resistive capacity of their bed and bank materials against erosion. They were also used to provide information about the capacity of streams to adjust and recover from potential changes in flow and/or increase in sediment production (Forest Service, Northern Region 1975). The perennial streams in the Sandy area were evaluated in 1975 using the channel stability system developed by the U.S. Forest Service (USFS).

MAP 2-7, included in Volume 3 of this FES, shows the existing channel stability rating for the Sandy area. The average condition on NRL is summarized by major streams in FIGURES 2-16 and 2-17. TABLE 2-12 lists the estimated channel stability for all the streams in the Sandy area by allotment. Where the streams are unsurveyed, the conditon is estimated based on nearby surveyed conditions. APPENDIX 2G includes a more detailed analysis of channel stability on these streams. The attainable condition is the expected improvement that could be obtained by eliminating physical damages that are occurring; it also indicates present physical damage.

Snow

Snow relocation by cold winter winds is a distinctive feature of the sagebrush lands of the Sandy area. The

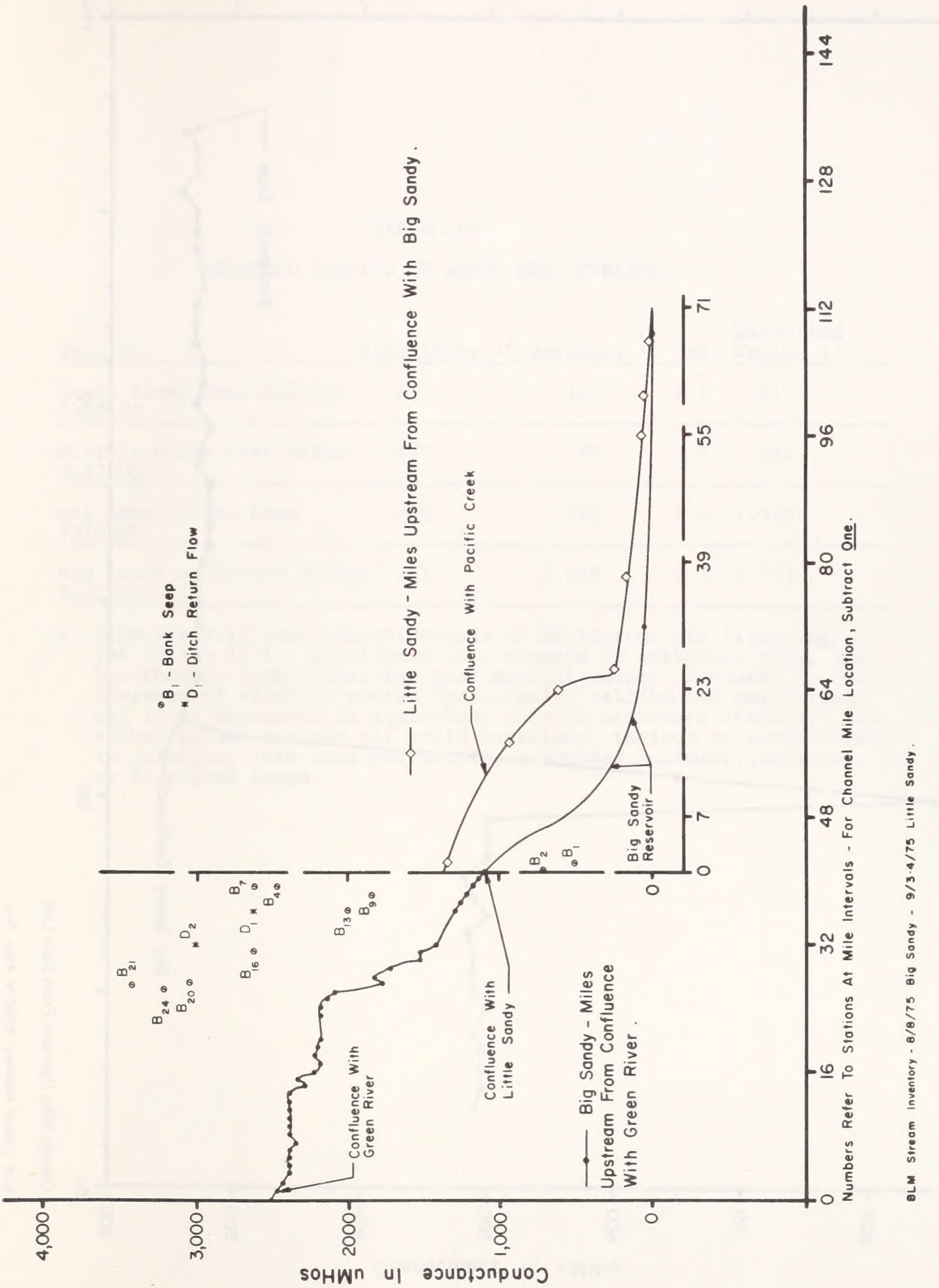


FIGURE 2 - 10 Solute Concentration - Sandy Drainage.

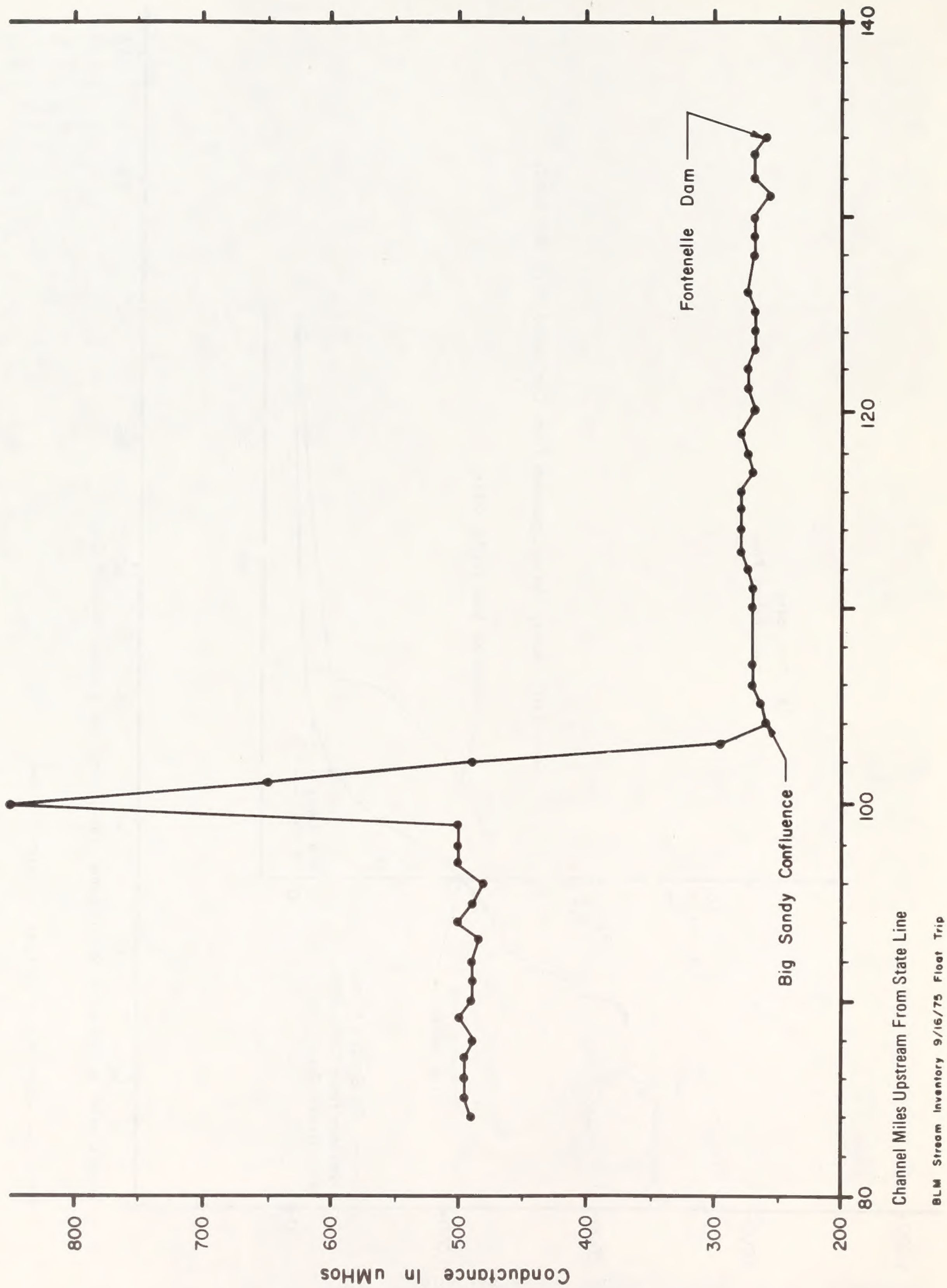


FIGURE 2 - 11 Solute Concentration-Green River.

TABLE 2-9

CHEMICAL QUALITY OF SANDY AREA STREAMS

Station	Alkalinity 1/	Hardness 1/	pH	Dissolved Solids 1/
Green River Near LaBarge 9209400	137	161	7.9	211
Pacific Creek Near Farson 9215000	135	72	8.2	423
Big Sandy Below Eden 9216000	209	806	8.0	1,910
Big Sandy at Gasson Bridge 9216050	261	1,038	8.1	2,713

1/ Flow weighted mean concentrations in milligrams per liter (mg/l) for 1974 - 1976. Alkalinity is a measure of carbonate (CO_3) and bicarbonate (HCO_3) ions for most natural water. Hardness is the presence of alkaline earths (principally calcium and magnesium), and it is expressed as equivalent calcium carbonate ($CaCO_3$). Dissolved solids include all solid materials, ionized or not ionized, in solution; this does not include suspended sediment, colloids, or dissolved gases.

TABLE 2-10

WATER QUALITY STANDARDS 1/

Parameter	Public Water Supply Standards	Livestock and Wildlife Standards	Cold Water Fisheries	Comments
Suspended Sediment	2/	2/	80 mg/l	Affects water potability and physical habitat for fish.
Total Dissolved Solids	500 mg/l	3,000 mg/l	2,000 mg/l	Above 3,000 mg/l could be injurious to stock and wildlife (EPA 1975).
Specific Conductance	2/	2/	2/	Used to predict dissolved solids and aquatic productivity.
pH	5.0 to 9.0	7.0 to 9.2	6.5 to 9.0	Indicator of hydrogen ion concentration and aquatic productivity.
Alkalinity	2/	30-130 mg/l 3/	20 mg/l minimum	Above 170 mg/l can cause diarrhea with stock (McKee and Wolf 1963).
Fecal Coliform 4/ Organisms	0/100 ml	2/	2/	Indicator of pathogenic bacteriological contamination.
Temperature	5/	2/	18.2° C maximum	

1/ Water quality standards recommended by the Wyoming Department of Environmental Quality.
2/ No recommended standard.
3/ Alkalinity is shown as concentration of calcium carbonate ($CaCO_3$); from National Academy of Science, 1972.
4/ Standards set for the recreation season (May 1 to September 30) is 200/100 ml for primary contact recreation (Wyoming Department of Environmental Quality 1974).
5/ No temperature change has been identified that would adversely affect the potability of public water supplies.

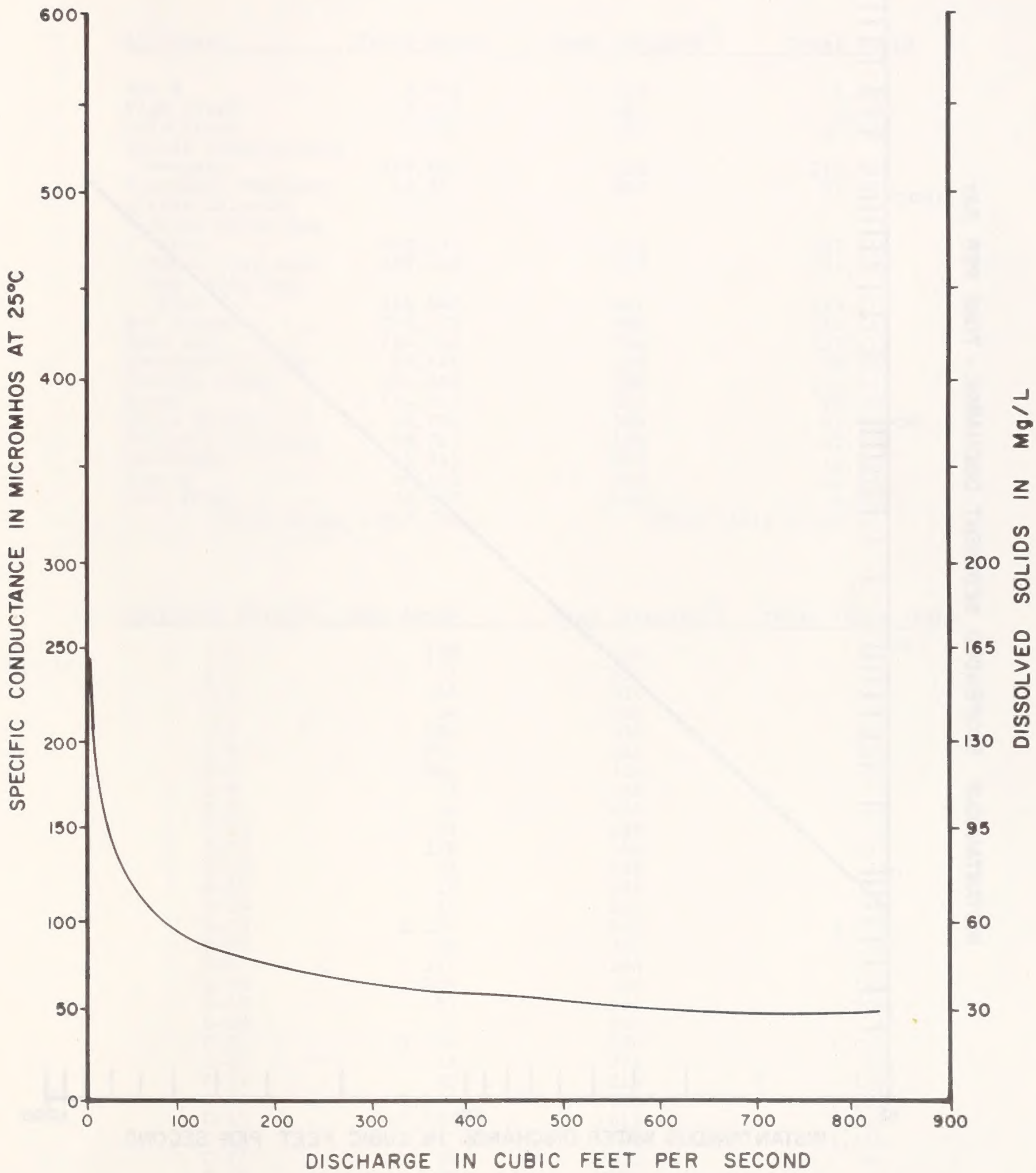


FIGURE 2 - 12 Typical Relationship of Dissolved Solids to Discharge at Station 09213500 Big Sandy River Near Farson, Wyoming (1962 - 1964 Water Years).

FIGURE 2 - 13 Typical Relationship of Suspended Sediment Load to Discharge at Station 09213500 Big Sandy River Near Farson, Wyoming (1972 - 1976 Water Years).

TABLE 2-11

SEDIMENT YIELD IN TONS BY ALLOTMENT AND CUSTODIAL PASTURE

Allotment	Total Acres	Mean (Tons/Mi^2)	Total Yield
Bar X	6,895	450	4,848
Fish Creek	7,237	450	5,089
Gold Creek	30,525	554	26,423
Little Sandy-Little Prospect	185,660	755	219,021
Steamboat Mountain	40,537	592	37,497
Little Colorado			
Green River Use Area	303,791	710	337,018
Farson Use Area	205,123	732	234,609
Big Sandy Use Area	218,042	481	163,872
Red Desert	245,375	690	264,545
Bush Rim	104,547	780	127,417
Continental Peak	88,478	576	79,630
Pacific Creek	202,856	556	176,231
Sands	114,852	533	95,650
White Acorn	46,794	599	43,796
Prospect Mountain	66,751	598	62,370
Reservoir	35,545	630	34,990
Poston	50,635	543	42,961
Pine Creek	14,089	450	9,906
TOTAL Acres	1,967,732	TOTAL Yield	1,965,873

Custodial Pasture	NRL Acres	Mean (Tons/Mi^2)	Total Yield (NRL)
C-1	170	630	167
C-2	77	630	76
C-3	144	630	142
C-4	54	630	53
C-5	297	630	292
C-6	503	612	481
C-7	265	450	186
C-8	13	450	9
C-9	96	450	68
C-10	71	450	50
C-11	178	450	125
C-12	66	630	65
C-13	13	630	13
C-14	16	630	16
C-15	2,209	630	2,174
C-16	96	702	105
C-17	197	684	210
C-18	120	900	169
C-19	191	684	204
C-20	3	900	4
C-21	1,094	630	1,077
C-22	19	774	23
C-23	92	810	116
C-24	1,197	600	1,122
C-25	2,153	612	2,059
C-26	1,677	630	1,650
C-27	98	630	96
C-28	80	630	79
C-29	13	630	13
C-30	1,083	630	1,066
C-31	537	1,260	1,057
C-32	85	900	119
C-33	8	630	8
	12,915 (of NRL)		13,094 (for NRL)

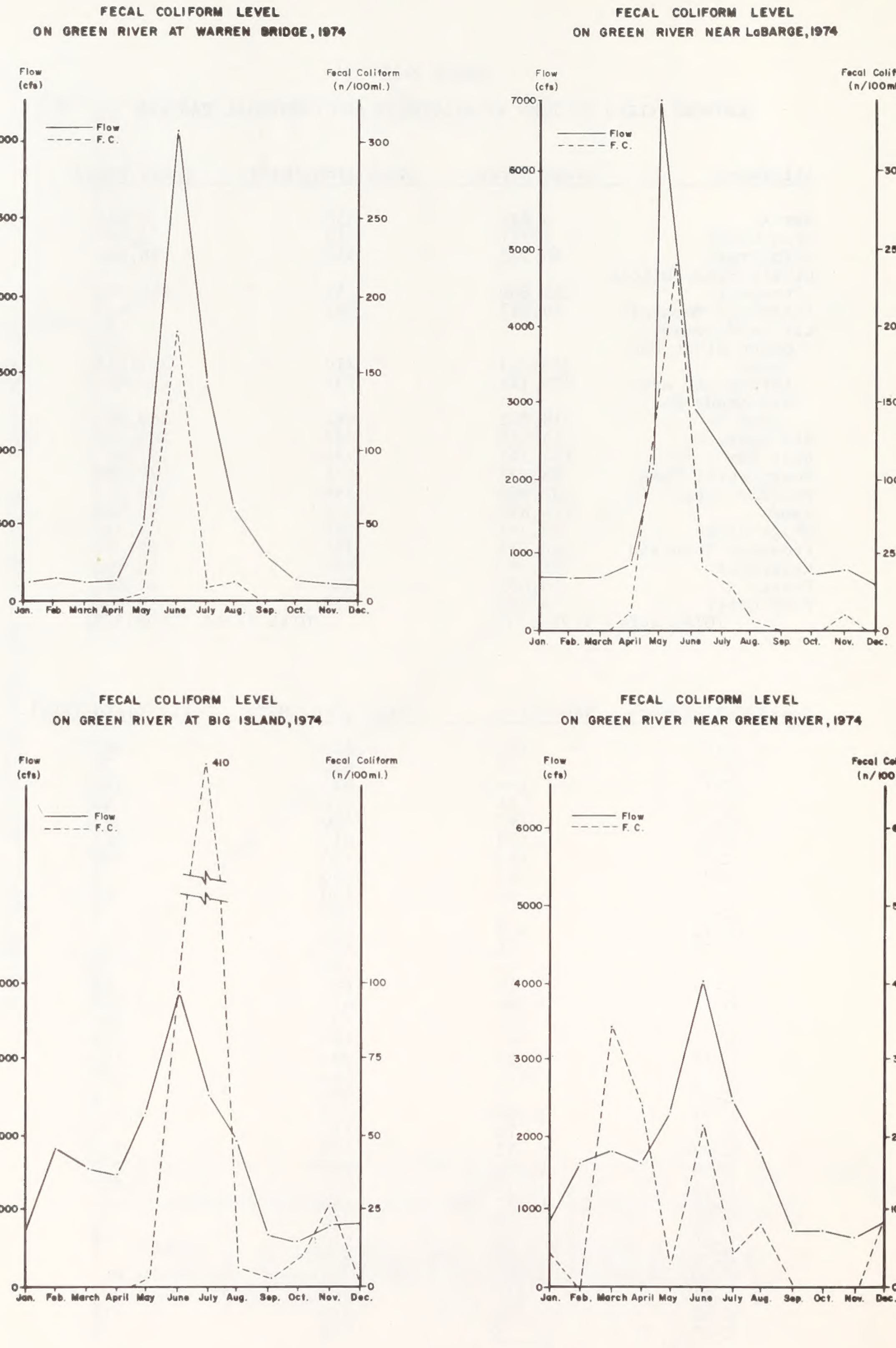
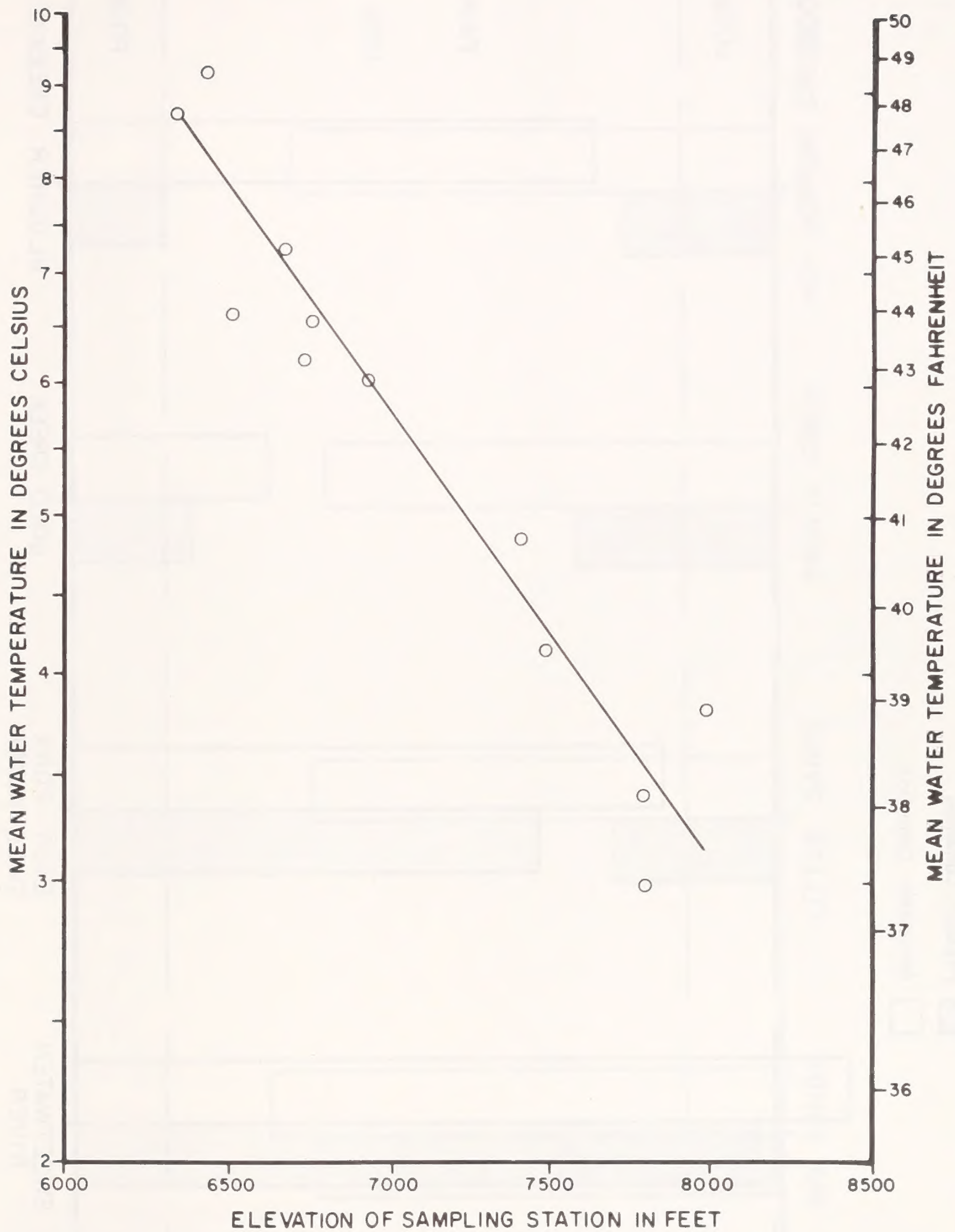


FIGURE 2-14 Fecal Coliform Levels on Green River.



Source: Adapted from Lowham et al. 1976.

FIGURE 2 - 15 Relations of Mean Annual Stream Temperature vs. Elevation of Sampling Station for Streams in and Near the Big Sandy.

FIGURE 2 - 16 Stream Channel Stability-Sweetwater Drainage.

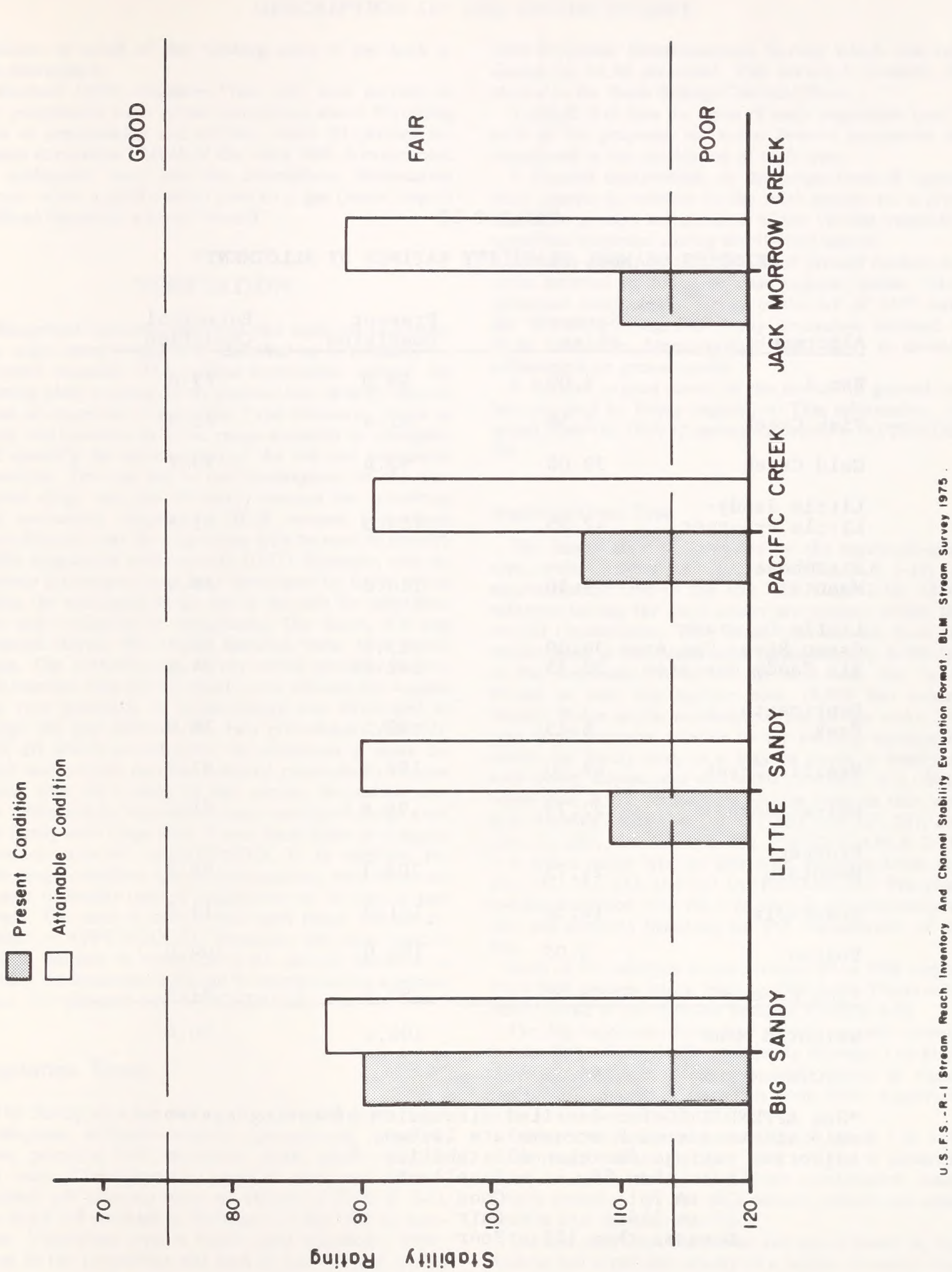


FIGURE 2-17 Stream Channel Stability-Sandy Drainage.

TABLE 2-12

EXISTING CHANNEL STABILITY RATINGS BY ALLOTMENT*

Allotment	Stream Miles	Present Condition	Potential Condition
Bar X	9.00	99.0	79.0
Fish Creek	5.50	92.4	83.5
Gold Creek	39.00	95.6	90.2
Little Sandy-Little Prospect	42.25	103.3	91.5
Steamboat Mountain	9.50	110.0	89.0
Little Colorado			
Green River Use Area	30.00	85.9	77.7
Big Sandy Use Area	30.25	102.2	94.6
Continental Peak	6.25	99.0	79.0
Pacific Creek	48.00	106.9	92.2
White Acorn	22.75	95.9	81.1
Prospect Mountain	24.75	103.1	98.2
Reservoir	14.50	111.0	111.0
Poston	3.00	104.0	104.0
Pine Creek	10.50	97.2	92.4
Weighted Mean		100.4	90.4
TOTAL MILES	295.25		

*See APPENDIX 2G for detailed discussion of rating system; only allotments with streams are listed.

Adjective ratings for channel stability:

Less than 38 - Excellent
39 to 76 - Good
77 to 114 - Fair
Greater than 115 - Poor

moisture of much of this blowing snow is lost back to the atmosphere.

Rechard (1973) estimates "that only four percent of the precipitable water in the atmosphere above Wyoming falls as precipitation and of that, about 20 percent becomes streamflow" Much of the other 80% is evaporated or sublimated back into the atmosphere. Sublimation occurs when a solid (snow) goes to a gas (water vapor) without becoming a liquid (water).

VEGETATION

Rangeland has been described and analyzed in numerous ways since it was first identified as a valuable, renewable resource. The earliest approaches utilized the existing plant community to separate and identify distinct areas of rangeland (Vegetation Type-Glossary). Years of study and research have led range scientists to recognize and quantify the relationships of the soil and vegetation resources. This has led to the development of the ecological range site (see Glossary) concept for describing and evaluating rangelands. BLM manual procedures have directed that the vegetation type be used to identify public rangelands until recently (1977). Recently, new inventory procedures have been developed by BLM which utilize the ecological range site as the unit for identification and evaluation of rangelands. The Sandy ES was prepared during the interim between these two procedures. The 1964-65 range survey which provides vegetation baseline data for the Sandy area utilized the vegetation type approach. A methodology was developed to bridge the gap between the two procedures (APPENDIX 2I) which provided for the utilization of more detailed and current data on potential productivity of ecological sites. As a result of this, various discussions contain references to vegetative types, ecological range sites, and Sandy area range sites. These three types of designations are explained in APPENDIX 2I. In addition, the term range condition has distinct meaning with reference to each particular type of designation for an area of rangeland. The same is true for the term trend. All are explained in APPENDIX 2J. Whenever the term trend is used in the text in reference to the present situation or existing environment, it should be interpreted as apparent trend. See Glossary and APPENDIX 2I.

Vegetation Types

The Sandy area has ten major vegetation types: sagebrush-grass, saltbush-winterfat, greasewood, meadow, grass, perennial forb, mountain shrub, conifer, barren, and waste. These primary vegetation types and their associated soil mapping units are shown in TABLE 2-13. See MAP 2-8 included in Volume 3 of the FES for locations. Vegetation type is based upon significant differences in the proportion and kind of native plant species that are predominant over an area. Vegetation patterns depend on the species' adaptability to soil association. Sandy area vegetation types are based on data from the 1964-65 Ocular Reconnaissance Survey which was conducted by BLM personnel. This survey is available for review in the Rock Springs District Office.

TABLE 2-14 lists the acres of each vegetation type in each of the proposed use areas. Several parameters are considered in the description of each type:

1. Percent composition, or the proportions of various plant species in relation to the total species on a given area. The percent composition of the various vegetation types was estimated during the 1964-65 survey.
2. Ground cover, or the amount of ground surface and rocks covered by living or dead organic matter. BLM personnel conducted a survey in the fall of 1975 using the Wyoming Integrated Study Procedure outlined in BLM Instruction Memorandum WSO 75-31 to develop information on ground cover.
3. Percent vegetal cover, or the amount of ground surface covered by living vegetation. This information, obtained from the 1964-65 survey, is shown in APPENDIX 2H.

Sagebrush-Grass Type

The Sandy area is dominated by the sagebrush-grass type, which covers 1,531,475 acres (TABLE 2-14), or approximately 77% of the area (FIGURE 2-18). Many subtypes having the same aspect are present within this overall classification. This broad type extends from the lowest point in the Sandy area (approximately 6,300 feet in the southwest corner of the area near the Green River) to near the highest point (9,300 feet around Muddy Ridge in the northeast corner of the area). The type is all inclusive relative to the varying topography within the Sandy area, as it may be found in nearly all soils types, slopes, and elevations (TABLE 2-2). Sagebrush-grass is the primary vegetation type on sites with Soil Mapping Units 114, 116, 121, 123, 124, 127, 217, 220, 221, 222, 223, 224, 225, 228, 320, and 328 (TABLE 2-13). It is also a major type on sites with Mapping Units 117, 126, 141, 143, 233, and 333 (APPENDIX 2I). The plant species associated with the type vary in percent composition and diversity based on the soil characteristic of the site.

Each of the subtypes varies between 40 to 70% shrubs, 30 to 60% grasses, and a trace to 10% forbs. Plants commonly found in this type are listed in TABLE 2-15.

The big sagebrush-dominated subtype covers approximately 90% of the type's total Sandy acreage. The black sagebrush-dominated areas are usually found in higher elevations, often in a transition zone from sagebrush-grass to the mountain shrub.

Subtypes codominated by rabbitbrush cover 5 to 15% of the sagebrush-grass type. This subtype is generally found on sandy soils in the lower precipitation zones. This is evidenced by the high percent rabbitbrush composition near the sand dune area.

The low sagebrush-dominated subtype is found on dry, shallow soil types and usually at a higher elevation than the big sagebrush types. There is some question as to the validity of the low sagebrush species' proper identification. It is felt that this sagebrush species may be a sub-

TABLE 2-13

VEGETATION TYPES IN THE SANDY AREA

Soil Mapping Units*	Primary Vegetation Types*	Acres**	Percent of Area**
114, 116, 121, 123, 124, 127, 217, 220, 221, 222, 223, 224, 225, 228, 320, 328	Sagebrush-Grass	1,531,475	77
111, 117, 126	Saltbush-Winterfat	190,463	10
110, 113, 115	Greasewood	100,740	5
210, 310	Meadow (Wet and Dry)	48,221	2
211	Grass	38,820	2
141, 142, 143	Perennial Forb	30,635	2
233, 333	Mountain Shrub	29,654	1
350	Conifer	20,887	1
119, 132, 140	Barren	4,400	0
	Waste	2,035	0
	TOTALS*	1,997,330	100

* These soil mapping units and primary vegetation types were the basis for the soil vegetative analysis in TABLES 2-24, 2-25, and 2-26.

**Includes NRL, State, and private lands in custodial pastures and allotments. Does not include 1,590 acres of U.S. Fish and Wildlife Service land, 160 acres of U.S. Forest Service land, and 970 acres of the no grazing area.

TABLE 2-14

VEGETATION TYPES IN ACRES BY ALLOTMENT AND CUSTODIAL PASTURE

Allotment	Sagebrush-Grass	Saltbush-Winterfat	Grass	Meadow	Greasewood	Mountain Shrub	Perennial Forb	Conifer	Barren	Waste	Allotment Total Acres
1. Bar X	4,675	0	0	2,220	0	0	0	0	0	0	6,895
2. Fish Creek	6,241	0	0	996	0	0	0	0	0	0	7,237
3. Gold Creek	18,315	0	0	4,595	0	4,565	0	3,050	0	0	30,525
4. Little Sandy-Little Prospect	166,970	0	0	10,445	0	8,245	0	0	0	0	185,660
5. Steamboat Mtn.	30,711	0	0	1,010	5,421	1,920	1,475	0	0	0	40,537
6. Little Colorado	643,909	33,674	12,364	5,330	24,519	0	0	7,160	0	0	726,956
7. Red Desert	73,465	131,965	2,085	0	35,405	0	1,720	0	0	735	245,375
8. Bush Rim	76,216	8,180	1,495	990	11,216	1,985	3,065	1,400	0	0	104,547
9. Continental Peak	55,564	11,164	3,795	1,405	1,435	1,610	12,840	0	0	665	88,478
10. Pacific Creek	165,672	5,480	6,635	970	18,169	3,950	775	695	510	0	202,856
11. Sands	80,371	0	12,446	1,360	4,575	0	10,630	3,075	1,760	635	114,852
12. White Acorn	41,259	0	0	1,468	0	1,610	0	2,457	0	0	46,794
13. Prospect Mtn.	56,401	0	0	3,895	0	0	0	0	2,130	0	35,545
14. Reservoir	29,520	0	0	3,895	0	0	0	0	2,130	0	35,545
15. Poston	47,835	0	0	2,800	0	0	0	0	0	0	50,635
16. Pine Creek	13,329	0	0	760	0	0	0	0	0	0	14,089
TOTAL ALLOTMENT ACRES	1,510,453	190,463	38,820	41,684	100,740	28,045	30,505	20,587	4,400	2,035	1,967,732

Custodial Pasture	Sagebrush-Grass	Saltbush-Winterfat	Grass	Meadow	Greasewood	Mountain Shrub	Perennial Forb	Conifer	Barren	Waste	Custodial Pasture Total Acres
C-1	51			80			130				261
C-2	29			75							104
C-3	116			100							216
C-4	31			60							91
C-5	428			50							478
C-6	691			25							716
C-7	496			75							571
C-8	98			310							408
C-9	373			0				300			673
C-10	658			75							733
C-11	841			75							916
C-12	74			115							189
C-13	19			80							99
C-14	24			0							24
C-15	1,881			885							2,766
C-16	0			0		234					234
C-17	185			360							545
C-18	159			100							259
C-19	319			75							394
C-20	0			54							54
C-21	1,327			300		350					1,977
C-22	254			0							254
C-23	302			50							352
C-24	1,492			750							2,242
C-25	2,983			225							3,208
C-26	1,454			150		1,025					6,629
C-27	208			1,000							1,208
C-28	560			320							880
C-29	762			0							762
C-30	4,312			50							4,362
C-31	835			850							1,685
C-32	60			160							220
C-33	0			88							88
CUSTODIAL TOTALS	21,022	0	0	6,537	0	1,609	130	300	0	0	29,598
GRAND TOTALS*	1,531,475	190,463	38,820	48,221	100,740	29,654	30,635	20,887	4,400	2,035	1,997,330

*Includes NRL, State, and private lands in custodial pastures and allotments. Does not include 1,590 acres of U. S. Fish and Wildlife Service lands, 160 acres of U. S. Forest Service lands, and the 970-acre Palmer Draw no grazing area.

FIGURE 2-18 SAGEBRUSH-GRASS. About 77% of the Sandy area is dominated by this vegetation type. The upper photo is typical of the majority of this Desert Allotment. The range condition here is fair with an apparent upward trend for cattle, sheep and horses. The lower photo depicts a sagebrush-grass type in the Pine Creek Allotment which is at a high elevation on shallow soils in fair condition for all classes of livestock and in apparent upward trend for cattle but static for sheep.

TABLE 2-15

COMMON PLANTS IN THE SAGEBRUSH-GRASS TYPE

Grasses	Forbs	Shrubs
Western wheatgrass	Phlox	Big sagebrush
Thickspike wheatgrass	Lupine	Rabbitbrush
Indian ricegrass	Wild buckwheat	Black sagebrush
Needle-and-thread grass		Low sagebrush
Bluebunch wheatgrass		
Sandberg bluegrass		

species *of Artemisia tridentata*, but more likely it is *Artemisia longiloba* (Beetle 1960). Bluebunch wheatgrass, western wheatgrass, phlox, and wild buckwheat are major understory plants as associated with this subtype.

Percent vegetal cover for this major type ranges from approximately 11% in the Steamboat Mountain Allotment to 17% in the Bar X and Gold Creek Allotments. Ground cover for the sagebrush-grass type varies considerably for each allotment. The percent ground cover for the type ranges from a low of 25% in the Little Colorado Allotment to 56% in the Pine Creek Allotment (APPENDIX 2H).

Forage Production. Production of the sagebrush-grass type of the Sandy area averages approximately 17 acres per animal unit month (AUM) for cattle and 13 acres per AUM for sheep. (See APPENDIX 2I for methods of calculation.) The allotments in the lower elevations such as Little Colorado, Pacific Creek, Red Desert, and Sands have consistently lower carrying capacities than do those in higher elevations that receive generally higher precipitation. Detailed grazing capacity information by vegetation type is available for review in the Rock Springs District office.

The average production for those wildlife species within the sagebrush-grass type of the Sandy area follows: antelope, 10.8 acres per AUM; deer, 5.5 acres/AUM; elk, 5.1 acres/AUM; and moose, 42 acres/AUM.

Saltbush-Winterfat Type

The saltbush-winterfat vegetation type (FIGURE 2-19) comprises 190,463 acres, (TABLE 2-14), or approximately 10% of the total area. This type is characteristic of the more alkaline lowlands within the Sandy area where tight, impervious soils are common. Saltbush-winterfat is the primary vegetation type on sites with Soil Mapping Units 111, 117, and 126 (TABLE 2-13). It is also a major type in sites with Mapping Units 113, 115, and 127. The Great Divide Basin, which includes the Continental Peak, Bush Rim, and Red Desert Allotments, has a predominance of this vegetation type.

Sparse cover and considerable bare ground are generally characteristic of this type. The composition is 70 to 90% shrubs, 10 to 20% grasses, and a trace of 20% forbs. Plants commonly found are listed in TABLE 2-16.

The variations of subtypes within this larger overall type are relatively minor compared to those described for the sagebrush-grass vegetation type. The species association remains fairly constant, with percent composition being the primary variable. Big sagebrush and black greasewood are the primary species which would increase in percent composition on the fringes of the saltbush-winterfat type.

The ground cover averages 65% over the area and is fairly constant. The vegetal cover averages only 10%, making areas with this vegetation type highly susceptible to erosion (APPENDIX 2H).

Forage Production. Production in the saltbush-winterfat type for the Sandy area averages 22 acres/AUM for cattle and 14 acres/AUM for sheep (APPENDIX 2I). The carrying capacity for this type ranges from 12 acres/AUM in the Bush Rim Allotment to 33 acres/AUM in the Little Colorado Allotment.

The estimated production figures for wildlife species utilizing this vegetation type are antelope, 5.5 acres/AUM; deer, 3.3 acres/AUM, and elk, 7.6 acres/ AUM. No carrying capacity is recognized for moose.

Greasewood Type

This vegetation type comprises approximately 5% of the Sandy area, or 100,740 acres (TABLE 2-14). FIGURE 2-20 is a representative view of a greasewood type. The type is characteristic of alkaline soils along live and intermittent stream basins in the lower elevations of the area. The soils in these areas are generally too saline to support a high density of meadow type grasses, yet they have a high enough water content to retard heavy concentrations of desert shrubs. Total percent density is low, resulting in a high erosion condition. Many of the areas are currently receiving considerable amounts of water and wind erosion (TABLE 2-3).

Greasewood is the primary vegetation type on sites with Soil Mapping Units 110 and 115 (TABLE 2-13). It is a major type on sites with Mapping Units 111 and 127.

Shrubs dominate the composition of the type, ranging from 40 to 70%. Grasses usually compose 10 to 30% and forb species 2 to 30% of the vegetation. TABLE 2-17 is a list of common species found in the greasewood type.

The percent ground cover for the greasewood type ranges from 14% in the Sands and Bush Rim Allotments to 74% in the Continental Peak Allotment. The vegetal cover varies from 6% in the Red Desert Allotment to 21% in the Pacific Creek Allotment (APPENDIX 2H).

Forage Production. Production in the greasewood vegetation type averages 18 acres/AUM for cattle and 16 acres/AUM for sheep (APPENDIX 2I). The highest carrying capacity is 10 acres/AUM in the Pacific Creek Allotment and the lowest is 28 acres/AUM in the Little Colorado Allotment. Only seven of the 16 allotments contain this vegetation type.

The average production figures for the wildlife species utilizing this vegetation type in the seven allotments are antelope, 8.2 acres/AUM; deer, 6.4 acres/AUM, and elk, 10.0 acres/AUM. No carrying capacity is recognized for moose.

Meadow Type

The meadow type (FIGURE 2-21) makes up approximately 2% or 48,221 acres (TABLE 2-14) of the Sandy area vegetation. Within this type both wet and dry meadows have been combined. The dry meadow subtype (approximately 20% of the total) is similar to the wet meadow subtype in vegetative species makeup including sedges, rushes, and bluegrasses. Dry site shrubs such as sagebrush and rabbitbrush are in more abundance in the dry meadow subtype than in the wet meadow subtype. The dry meadow subtype has a wider range of occurrence although it makes up a much smaller area. It is

FIGURE 2-19 SALTBUSH-WINTERFAT. This type is shown in fair condition for livestock with apparent upward trend for sheep and apparent static trend for cattle and horses.

TABLE 2-16

COMMON PLANTS IN THE SALTBUSH-WINTERFAT TYPE

Grasses	Forbs	Shrubs
Bottlebrush squirreltail	Phlox	Nuttall saltbush
Western wheatgrass	Wild buckwheat	Winterfat
Indian ricegrass	Kochia	Shadscale
Sandberg bluegrass		

FIGURE 2-20 GREASEWOOD TYPE. This vegetation is in fair condition for livestock, upward trend for sheep, and static trend for cattle and horses.

FIGURE 2-21 MEADOW VEGETATION TYPE. The upper photo depicts a meadow type in the Prospect Mountain Allotment in good condition and in an apparent static trend for cattle, horses, and sheep. The lower photo depicts a meadow vegetation type in the Fish Creek Allotment in poor condition and in an apparent downward trend for all animal classes.

found in many intermittent stream areas and around small stockwater reservoirs which tend to dry up during the year. It is the primary subtype on sites with Soil Mapping Units 210 and 310 (TABLE 2-13) and a major subtype on sites with Mapping Unit 211.

Wet meadows are associated with live water areas, including streams, springs, and large bodies of water. A much greater species diversity is prevalent in these types. The majority of the wet meadow areas are located along the Big Sandy River, Little Sandy and Dry Sandy tributaries, and the Sweetwater River. Smaller, yet very significant meadow areas are located along larger intermittent drainages where springs and seeps originate then sink into their stream course. These springs and seeps occur throughout the Sandy area. The sand dune areas, primarily in the Sands Allotment, have numerous wet meadows around seeps and potholes where a high water table is present.

The wet meadow type includes the "riparian zone,"the area immediately adjacent to a water source. Riparian vegetation relies upon a high water table and is a prime component of the wet meadow vegetation type.

Willows are a key plant in some parts of the Sandy area. Other sites may have few shrubs in the riparian area. Where willows do not exist, the shoreline is covered by grass, grasslike plants, or bare soil.

The riparian zone is an important area for livestock as well as many of the wildlife species in the Sandy area. The shading effect of the shoreline shrubs is important to trout habitat. Riparian zones have not been completely inventoried in the Sandy area.

Grasses and grasslike plants make up the majority of the vegetation within the meadow type (up to 80%). Forbs usually are from 5% to 20% of the composition. Shrub species vary between a trace and 5%. TABLE 2-18 is a listing of the most common species.

Percent ground cover for the meadow type ranges from 97% in the Continental Peak and Bush Rim Allotments to 34% in the Little Colorado Allotment along the Big Sandy River. Vegetal ground cover varies from 32% in the Little Colorado Allotment to 17% in the Pacific Creek Allotment. Overall average vegetal ground cover for the meadow type in the Sandy area is 26% (APPENDIX 2H).

Forage Production. Production in the meadow vegetation type averages 4.6 acres/AUM for cattle and 6.8 acres/AUM for sheep (APPENDIX 2I). Carrying capacity for this type ranges from 3 acres/AUM in the Fish Creek and Continental Peak Allotments to 11.4 acres/AUM in the Bush Rim Allotment.

The average production figures for the wildlife species within the various allotments are antelope, 13.5 acres/AUM; deer, 4.4 acres/AUM; elk, 2.3 acres/ AUM; and moose, 6.5 acres/AUM.

Grass Type

The grass type (FIGURE 2-22) comprises approximately 2% of the total Sandy area, or 38,820 acres (TABLE 2-14). Seventy-five percent of the type is located on sandy soils within the northern part of the Little Colorado Allotment and in the sand dune belt along the southern portion of the Sandy area. It is the primary vegetation type on sites with Soil Mapping Unit 211 (TABLE 2-13).

The composition is from 40% to 80% grass, a trace to 20% shrubs, and a trace to 20% forbs. TABLE 2-19 is a list of the most common species.

Percent ground cover for the grass type ranges from 47% in the Pacific Creek Allotment to approximately 18% in the Red Desert, Bush Rim, and Continental Peak Allotments. Percent vegetal cover ranges from a low of 12% in the Pacific Creek Allotment to 23% in the Little Colorado Allotment with an average overall of 16%.

Forage Production. Production in the grass vegetation type averages 10.5 acres/AUM for cattle and 10.6 acres/AUM for sheep (APPENDIX 2I). The highest carrying capacity for this type occurs in the Continental Peak Allotment with an 8-acre/AUM factor. The Sands Allotment has the lowest carrying capacity (14 acres/AUM).

The estimated production figures for the various wildlife species utilizing this type within the identified allotments are antelope, 21.6 acres/AUM; deer, 11.4 acres/AUM; and elk 6.4 acres/AUM. No carrying capacity is recognized for moose.

Perennial Forb Type

The perennial forb type encompasses 30,635 acres (TABLE 2-14), or 2% of the Sandy area. It is split nearly evenly between the Great Divide Basin (FIGURE 2-23), where phlox is the major component of the type (5 to 50%), and the sand dune area (FIGURE 2-23), where scurfpea has the highest percent composition (20 to 60%).

This type has a low production capacity due to the poorly developed soils with low moisture availability. It is the primary type on sites with Soil Mapping Units 141, 142, and 143 (TABLE 2-13). Common species are listed in TABLE 2-20.

The highest ground cover (22%) occurs in the Continental Peak Allotment, and the lowest ground cover (11%) is found in the sand dune areas of the Pacific Creek and Sands Allotments. The lowest percent vegetal cover occurs in the Steamboat Mountain Allotment with 6% and the highest in Continental Peak Allotment with 14% (APPENDIX 2H).

Forage Production. Perennial forb production is relatively low. It averages 45 acres/AUM for cattle and 35 acres/AUM for sheep in six allotments in the Sandy area (APPENDIX 2I). The highest carrying capacity for this type occurs in the Continental Peak Allotment with 12 acres/AUM, while the Pacific Creek Allotment has the lowest with 77 acres/AUM.

Wildlife production figures for this type have been averaged as follows: antelope, 70.1 acres/AUM; deer, 40.1 acres/AUM; and elk, 36.0 acres per AUM. No carrying capacity was identified for moose.

TABLE 2-17

COMMON PLANTS IN THE GREASEWOOD TYPE

Grasses	Forbs	Shrubs
Desert saltgrass	Kochia	Black greasewood
Bottlebrush squirreltail	Halogeton	Nuttall saltbush
Foxtail barley	Russian thistle	Rabbitbrush
Western wheatgrass	Wild buckwheat	

TABLE 2-18

COMMON PLANTS IN THE MEADOW TYPE

Grasses	Forbs	Shrubs
Desert saltgrass	Pussytoes	Willow
Wire rush	Milkweed	Shrubby cinquefoil
Sedge	Dandelion	Nuttall saltbush
Muhly grass		Silver sagebrush
Bluegrass		Black greasewood
Tufted hairgrass		

FIGURE 2-22 GRASS VEGETATION TYPE. The upper photo shows a stabilized sand dune area in the Sands Allotment in poor condition for livestock with an apparent upward trend for cattle, horses, and sheep. The lower photo shows an upland area in the Little Colorado Allotment in fair condition with an apparent upward trend for livestock.

FIGURE 2-23 PERENNIAL FORBS. The top photo shows the Great Divide Basin in the Continental Peak Allotment in fair condition for cattle, horses and sheep. There is a static trend for all livestock. The bottom photo shows the sand dune area of the Sands Allotment in poor condition for cattle and sheep with downward trend for sheep and static trend for cattle and horses.

TABLE 2-19

COMMON PLANTS IN THE GRASS TYPE

Grasses	Forbs	Shrubs
Sedge	Pussytoes	Black greasewood
Desert saltgrass	Milkweed	Horsebrush
Alkali sacaton	Dandelion	Nuttall saltbush
Bluegrass		Big sagebrush
Western wheatgrass		
Indian ricegrass		

TABLE 2-20

COMMON PLANTS IN THE PERENNIAL FORB TYPE

Grasses	Forbs	Shrubs
Bluegrass	Phlox	Nuttall saltbush
Sedges	Scurfpea	Buckwheat
		Rabbitbrush
		Big sagebrush
		Birdsfoot sagewort

Mountain Shrub Type

Approximately 29,654 acres (TABLE 2-14), or 1.5% of the Sandy area, is mountain shrub (FIGURE 2-24), which is a major type with several subtype delineations. These are primarily sagebrush subtypes, such as black sagebrush and low sagebrush. Aspen and bitterbrush form the dominant aspect for this type. This vegetation type is generally located in the transition zone between the sagebrush grass type and conifer type. It is the primary type on sites with Soil Mapping Units 233 and 333 (TABLE 2-13). The elevation of these zones is nearly 8,000 feet, and the precipitation is 10 to 15 inches per year. Soils are generally deep and high in nutrient content. This environment results in a much higher percent plant cover, species diversity, and more litter accumulation than in most vegetation types within the Sandy.

The mountain shrub type in the Sandy area is common from the Continental Divide across the Wind River Front below the conifer type; small areas are found in some of the higher elevations near the Red Desert. Examples of this situation include portions of Steamboat Mountain, Bush Rim, and Oregon Buttes. These areas are quite small, but significant, when compared to the drier vegetation types immediately adjacent to them.

The plant species makeup of this vegetation type is characteristically one of a great variety of shrubs and trees. The aspect is readily identified by a canopy of aspen or tall growing shrubs such as serviceberry. Surrounding this basic aspect and in the understory are lower growing shrub species which are very important to livestock grazing. Shrubs are 30 to 80% of the composition. A large variety of grass species is common, usually making up 20 to 40% of the composition due to the high precipitation received during the course of the year.

Forb composition varies from 2 to 15%. Common species in the type are listed in TABLE 2-21.

Ground cover for the mountain shrub type averages approximately 77% with a high of 94% in the Continental Peak and Pacific Creek Allotments and a low of 53% in the White Acorn Allotment. The range of percent vegetal cover is from 12% in the Little Sandy-Little Prospect Allotment to 19% in the Bush Rim and Continental Peak Allotments. The average for this type in the Sandy area is approximately 16% (APPENDIX 2H).

Forage Production. Production in the mountain shrub type averages 11 acres/AUM for cattle and 10 acres/AUM for sheep in eight of the sixteen allotments (APPENDIX 2I). Carrying capacity ranges from 9 acres/AUM in the Prospect Mountain Allotment and the Little Sandy-Little Prospect Alltoment to 13 acres/AUM in the Pacific Creek Allotment.

Wildlife production figures include antelope, 8.1 acres/AUM; deer, 3.8 acres/AUM; elk, 4.6 acres/AUM; and moose, 29.0 acres/AUM.

Conifer Type

The conifer type covers 20,887 acres (TABLE 2-14) and is characteristically located in the higher elevations of the Sandy area. It is the primary vegetation type on sites with Mapping Units 350 (TABLE 2-13). This broad type includes subtypes which are predominantly juniper and limber pine intermixed (FIGURE 2-25). These subtypes are found in the drier regions of the Sandy area such as on the eastern face of White Mountain, on Essex Mountain north of the sand dunes, and in the rough badlands located on the western side of the Sandy area adjacent to the Green River.

The juniper-limber pine subtype has a desert shrub understory along with desert climate grass species. Common species of this subtype are listed in TABLE 2-22.

The more classic conifer subtype is the lodgepole pine aspect (FIGURE 2-25) located on the upper portions of Oregon Buttes, Prospect Mountain, and in the areas adjacent to the Bridger-Teton National Forest along the Wind River Front. The areas adjacent to the National Forest are considered the only ones in the Sandy area with commercial stands of timber. The lodgepole pine areas are at the highest elevations and most rugged portions of the Sandy area, where rain and snow are greatest and most frequent. TABLE 2-23 lists common species.

Ground cover for the conifer type ranges from 27% in the Little Colorado Allotment to 93% in the Prospect Mountain Allotment. The area-wide average for the type is 72%. Percent vegetal cover varies from 12% in the Little Colorado Allotment to 3% in the Prospect Mountain Allotment. The average vegetal cover for this type in the total Sandy area is 9% (APPENDIX 2H).

Forage Production. Production of the conifer types ranges from 48 acres/AUM for cattle to 63 acres/AUM for sheep (APPENDIX 2I).

The average production figures for wildlife within this vegetation type are deer, 13.6 acres/AUM; elk, 12.4 acres/AUM; and moose, 22.7 acres/AUM. No carrying capacity is recognized for antelope.

Barren Type

Approximately 4,400 acres (TABLE 2-14) have been typed as barren (FIGURE 2-26) in the Sandy area. The Big Sandy Reservoir, which covers 2,130 acres in the Reservoir Allotment, is part of this area. This classification is determined for an area which has 2% or less vegetal cover. The type has little or no carrying capacity for livestock and is considered unsuitable for livestock grazing. These types are generally of very small and scattered acreages making it impractical to restrict livestock grazing. The barren type is found primarily in the active sand dune area of the Sands Allotment, in the badlands around Continental Peak, and on the fringes of the Great Divide Basin.

Waste Type

This type makes up less than 1% of the Sandy area, or 2,035 acres (TABLE 2-14). The waste type is classified as an area which is inaccessible to livestock or has such a

FIGURE 2-24 MOUNTAIN SHRUBS. This vegetation is in fair condition for livestock with an upward trend for sheep and static trend for cattle and horses.

TABLE 2-21

COMMON PLANTS IN THE MOUNTAIN SHRUB TYPE

Grasses	Forbs	Shrubs
Brome	Lupine	Antelope bitterbrush
Timothy	Phlox	Snowberry
Bluegrass	Buckwheat	Cinquefoil
Idaho fescue		Rose
Needle grass		Black sagebrush
		Big sagebrush
		Serviceberry

TABLE 2-22

COMMON PLANTS IN THE JUNIPER-LIMBER PINE SUBTYPE

Grasses	Forbs	Shrubs	Trees
Bluebunch wheatgrass	Buckwheat	Shadscale	Juniper
Indian ricegrass	Phlox	Nuttall saltbush	Limber pine
Bluegrass		Big sagebush	
Western wheatgrass		Rabbitbrush	
Bottlebrush squirreltail		Black sagebrush	

TABLE 2-23

COMMON PLANTS IN THE LODGEPOLE PINE SUBTYPE

Grasses or Grasslike	Shrubs	Trees
Elk sedge	Huckleberry	Lodgepole pine
		Douglas fir
		Limber pine
		Subalpine fir
		Spruce
		Aspen

FIGURE 2-25 CONIFERS. The juniper - limber pine aspect is shown in the top photo. It is in fair condition for sheep and poor condition for cattle and horses. There is a downward trend for all livestock. The lower photo shows lodgepole pine aspect which is in fair condition for livestock with a static trend.

low carrying capacity that it discourages livestock use. This includes heavy timber or downed timber.

Inaccessible areas are common around the Oregon Buttes, Steamboat Mountain, and similar landforms throughout the Sandy area (FIGURE 2-27). The barren and waste types are located in numerous small, isolated land areas.

Threatened or Endangered Plants

During the summer of 1977, the Sandy area use surveyed for threatened or endangered vegetation species. The survey located *Lesquerella macrocarpa* in the Sandy area and *Antennaria* arcuata about 5 miles northeast of the area. Both of these plants are on the Federal list of proposed threatened or endangered species *(Federal Register,* 1 July 1975 and 16 *June 1976).*

Lesquerella *macrocarpa* occurs on naked clay flats and ridges and occurs in the Steamboat Mountain, Bush Rim, and Continental Peak Allotments. The survey showed that this plant is not being affected by livestock grazing; however, the population in the Continental Peak Allotment almost has been destroyed by trampling from wild *horses.*

Antennaria *arcuata* was located during the 1977 survey in meadows about 5 miles southeast of Atlantic City. Specimens were collected in 1905 in the meadows along the Sweetwater River near Atlantic City. This species could be present in the Bar X or Fish Creek Allotments (per. comm., Dorn). Formal consultation under Section 7 of the Endangered Species Act of 1973 has been initiated with the U.S. Fish and Wildlife Service to provide adequate protection.

Vegetation Production

Data from the 1964-65 Ocular Reconnaissance Survey was used to estimate the total vegetation production for each use area. Using the method outlined in APPENDIX 2I, the production of forage for sheep, cattle, horses, pronghorn, elk, deer, and moose was estimated (TABLES 2-24, 2-25, and 2-26). The production estimates for wildlife are limited to the areas that the animals utilize.

Within the Sandy area, a total of 125,500 AUMs of forage is produced for cattle; 142,861 AUMs for sheep; 93,560 AUMs for wild horses; 146,427 AUMs for pronghorn; 135,674 AUMs for deer; 54,134 AUMs for elk; and 7,629 AUMs for moose (TABLE 2-24). Many of the animals have similar diets so the volumes are not independent of one another. TABLE 2-27 shows the animal months that could be provided by the forage if only one animal species is considered.

Range Condition

Range condition for vegetation types (see Glossary) is the current composition of a vegetation type as it applies to its forage production potential for a particular grazing animal. It is based on the percent of desirable plant species available for that animal and on the area's erosion condition. Range conditions for sheep and cattle were determined in accordance with BLM Manual 4412.

Range condition for wildlife was determined for each vegetative type (see Glossary) and then aggregated for each allotment (APPENDIX 2I). The complete vegetation production study is available for review in the Rock Springs District Office. TABLES 2-28 and 2-29 and MAPS 2-9 through 2-14 (located at the end of this chapter) show the range condition for livestock and wildlife. This analysis is also available for review in the Rock Springs District Office. TABLE 2-30 shows existing range condition by allotment of the crucial habitat for each of the big game species.

Apparent Trend

Apparent trend for vegetation types (see Glossary) is the direction that the range condition appears to be taking (upward, down, or static). Only long-term studies accurately determine range trend, and this information does not exist for the Sandy area. In any given year, the apparent trend can be determined only on the basis of plant age, classes, condition, reproductive rate, and the soil erosion condition. BLM personnel conducted a survey during the summer of 1976 to determine the apparent trend of Sandy area range using the method outlined in APPENDIX 2I. More detailed survey information is available for review in the Rock Springs District Office.

Since the range condition relates only to a particular species, the apparent trend must also be related to the trend for that species. TABLES 2-31 and 2-32 and MAPS 2-15 through 2-20 (located at the end of this chapter) display the range trend for each of the large grazing species. TABLE 2-33 shows the apparent trend of the crucial habitat for each of the big game species.

WILDLIFE

Terrestrial

Each of the ten vegetation types produces a variety of food and cover for the various wildlife species in the Sandy area. Some of the animals stay close to a particular plant community or vegetation type, while others range throughout the surrounding region (TABLE 2-34). Some animals use the Sandy area throughout the year, while others migrate into the Sandy for certain seasons of the year (TABLE 2-35).

Numerous reports were used or developed in the preparation of this section. They are available for review in the Rock Springs District Office and include reports prepared in 1976 by Ecology Consultants, Inc. and the Chihuahuan Desert Research Institute under contracts with BLM.

Numerous difficulties were apparent in the preparation of information concerning wildlife conditions today and

FIGURE 2-26 BARREN VEGETATION TYPE. In an active sand dune area, this type is considered unsuitable for livestock grazing.

FIGURE 2-27 WASTE VEGETATION TYPE. Typical location of this type is the inaccessible area around Oregon Buttes.

TABLE 2-24

PRESENT VEGETATION PRODUCTION AND ACTUAL USE IN POUNDS OF DRY WEIGHT FORAGE AND AUMS FOR EACH GRAZING SPECIES BY ALLOTMENT

Allotment	Total Production Pounds Dry Weight Forage	Cattle: Production[1/] Pounds Dry Weight Forage (AUMs)	Cattle: Actual[2/] Use Pounds Dry Weight Forage (AUMs)	Sheep: Production[1/] Pounds Dry Weight Forage (AUMs)	Sheep: Actual[2/] Use Pounds Dry Weight Forage (AUMs)	Wild Horses: Production[1/] Pounds Dry Weight Forage (AUMs)	Wild Horses: Actual[3/] Use Pounds Dry Weight Forage (AUMs)	Pronghorn: Production[1/] Pounds Dry Weight Forage (AUMs)	Pronghorn: Actual[3/] Use Pounds Dry Weight Forage (AUMs)
1. Bar X	4,785,291	638,820 (819)	688,740 (883)	726,750 (969)	54,000 (72)	0 (0)	0 (0)	504,556 (626)	29,016 (36)
2. Fish Creek	6,664,354	654,420 (839)	702,000 (900)	683,250 (911)	0 (0)	0 (0)	0 (0)	690,742 (857)	35,464 (44)
3. Gold Creek	15,952,471	3,074,760 (3,942)	2,985,840 (3,828)	2,816,250 (3,755)	0 (0)	3,547,800 (3,942)	129,600 (144)	2,025,478 (2,513)	149,110 (185)
4. Little Sandy-Little Prospect	88,581,257	11,341,980 (14,541)	9,794,460 (12,557)	13,017,000 (17,356)	3,139,500 (4,186)	0 (0)	0 (0)	15,068,170 (18,695)	766,506 (951)
5. Steamboat Mountain	13,304,490	1,624,740 (2,083)	850,200 (1,090)	1,742,250 (2,323)	959,250 (1,279)	1,874,700 (2,083)	453,600 (504)	1,914,250 (2,375)	120,094 (149)
6. Little Colorado Green River Use Area	73,429,915	13,060,320 (16,744)	1,409,460 (1,807)	14,280,750 (19,041)	13,701,750 (18,269)	15,069,600 (16,744)	2,673,000 (2,970)	19,821,152 (24,592)	901,914 (1,119)
Farson Use Area	53,732,425	10,141,560 (13,002)	129,480 (166)	10,014,750 (13,353)	12,297,000 (16,396)	11,701,800 (13,002)	1,336,500 (1,485)	12,756,562 (15,827)	648,830 (805)
Big Sandy Use Area	21,120,016	8,191,560 (10,502)	317,460 (407)	8,657,250 (11,543)	9,858,000 (13,144)	9,451,800 (10,502)	1,800,900 (2,001)	13,276,432 (16,472)	785,044 (974)
7. Red Desert	88,499,209	14,079,000 (18,050)	0 (0)	14,174,250 (18,899)	14,626,500 (19,502)	16,245,000 (18,050)	6,296,400 (6,996)	13,311,090 (16,515)	502,944 (624)
8. Bush Rim	39,113,814	5,032,560 (6,452)	0 (0)	5,638,500 (7,518)	5,191,500 (6,922)	5,806,800 (6,452)	1,987,200 (2,208)	6,055,478 (7,513)	324,818 (403)
9. Continental Peak	33,570,987	4,878,120 (6,254)	0 (0)	5,884,500 (7,846)	5,770,500 (7,694)	5,628,600 (6,254)	1,836,000 (2,040)	5,528,354 (6,859)	261,950 (325)
10. Pacific Creek	69,038,565	8,623,680 (11,056)	560,820 (719)	10,707,750 (14,277)	10,250,250 (13,667)	9,950,400 (11,056)	1,036,800 (1,152)	7,783,542 (9,657)	736,684 (914)
11. Sands	34,013,372	4,270,500 (5,475)	3,737,760 (4,792)	4,809,750 (6,413)	735,750 (981)	4,927,500 (5,475)	615,600 (684)	5,849,948 (7,258)	299,832 (372)
12. White Acorn	27,115,106	4,160,520 (5,334)	5,460 (7)	4,054,500 (5,406)	4,132,500 (5,510)	0 (0)	0 (0)	2,893,540 (3,590)	182,962 (227)
13. Prospect Mountain	22,015,322	3,513,900 (4,505)	3,311,880 (4,246)	3,871,500 (5,162)	1,869,750 (2,493)	0 (0)	0 (0)	4,569,214 (5,669)	259,532 (322)
14. Reservoir	11,356,266	1,266,720 (1,624)	418,860 (537)	1,722,750 (2,297)	1,611,000 (2,148)	0 (0)	0 (0)	1,810,276 (2,246)	141,856 (176)
15. Poston	21,523,291	2,434,380 (3,121)	287,820 (369)	3,207,750 (4,277)	3,184,500 (4,246)	0 (0)	0 (0)	3,415,022 (4,327)	141,856 (176)
16. Pine Creek	4,899,960	902,460 (1,157)	516,360 (662)	1,136,250 (1,515)	606,750 (809)	0 (0)	0 (0)	673,816 (836)	41,106 (51)
TOTALS	628,716,111	97,890,000 (125,500)	25,716,600 (32,970)	107,145,750 (142,861)	87,988,500 (117,318)	87,204,000 (93,560)	18,165,600 (20,184)	117,525,777 (146,427)	6,329,518 (7,853)

TABLE 2-24 (Continued)

PRESENT VEGETATION PRODUCTION AND ACTUAL USE IN POUNDS OF DRY WEIGHT FORAGE AND AUMS FOR EACH GRAZING SPECIES BY ALLOTMENT

	Mule Deer		Elk		Moose		
Allotment	Production[1/] Pounds Dry Weight Forage (AUMs)	Actual[3/] Use Pounds Dry Weight Forage (AUMs)	Production[1/] Pounds Dry Weight Forage (AUMs)	Actual[3/] Use Pounds Dry Weight Forage (AUMs)	Production[1/] Pounds Dry Weight Forage (AUMs)	Actual[3/] Use Pounds Dry Weight Forage (AUMs)	Total Actual Use Pounds Dry Weight Forage (AUMs)
1. Bar X	564,258 (1,198)	68,730 (112)	0 (0)	0 (0)	76,140 (141)	0 (0)	840,486 (1,103)
2. Fish Creek	882,654 (1,874)	68,730 (112)	0 (0)	0 (0)	305,640 (566)	12,960 (24)	819,154 (1,080)
3. Gold Creek	2,364,420 (5,020)	345,714 (734)	2,637,900 (4,885)	447,120 (828)	684,180 (1,267)	38,880 (72)	4,096,264 (5,791)
4. Little Sandy-Little Prospect	15,358,839 (32,609)	2,238,192 (4,752)	3,294,540 (6,101)	2,021,760 (3,744)	1,298,700 (2,405)	181,440 (336)	18,141,858 (26,526)
5. Steamboat Mountain	1,889,181 (4,011)	50,868 (108)	1,980,720 (3,668)	77,760 (144)	0 (0)	0 (0)	2,511,772 (3,274)
6. Little Colorado Green River Use Area	3,482,574 (7,394)	0 (0)	0 (0)	0 (0)	46,440 (86)	0 (0)	18,686,124 (24,165)
Farson Use Area	61,701 (131)	0 (0)	0 (0)	0 (0)	1,080 (2)	0 (0)	14,411,810 (18,852)
Big Sandy Use Area	3,037,008 (6,448)	117,750 (250)	1,189,080 (2,202)	0 (0)	0 (0)	0 (0)	12,879,154 (16,776)
7. Red Desert	81,954 (174)	297,201 (631)	1,567,620 (2,903)	99,360 (184)	0 (0)	0 (0)	21,822,405 (27,937)
8. Bush Rim	3,321,021 (7,051)	123,402 (262)	4,968,540 (9,201)	172,800 (320)	0 (0)	0 (0)	7,799,720 (10,115)
9. Continental Peak	4,635,111 (9,841)	376,329 (799)	70,200 (130)	108,000 (200)	139,860 (259)	5,940 (11)	8,358,719 (11,069)
10. Pacific Creek	8,338,584 (17,704)	219,486 (466)	4,810,860 (8,909)	457,920 (848)	72,900 (135)	41,580 (77)	13,303,540 (17,843)
11. Sands	6,514,401 (13,831)	132,351 (281)	5,814,720 (10,768)	228,960 (424)	21,060 (39)	11,880 (22)	5,762,133 (7,556)
12. White Acorn	3,141,099 (6,669)	528,933 (1,123)	1,695,060 (3,139)	535,680 (992)	966,060 (1,789)	38,880 (72)	5,424,415 (7,931)
13. Prospect Mountain	4,752,390 (10,090)	528,933 (1,123)	1,015,740 (1,881)	656,640 (1,216)	234,360 (434)	45,360 (84)	6,672,095 (9,484)
14. Reservoir	1,823,712 (3,872)	243,978 (518)	0 (0)	0 (0)	17,280 (32)	19,440 (36)	2,435,134 (3,415)
15. Poston	2,995,560 (6,360)	20,253 (43)	0 (0)	0 (0)	13,500 (25)	12,960 (24)	3,647,389 (4,858)
16. Pine Creek	657,987 (1,397)	79,128 (168)	187,380 (347)	41,040 (76)	242,460 (449)	12,960 (24)	1,297,344 (1,790)
TOTALS	63,902,454 (135,674)	5,439,978 (11,482)	29,232,360 (54,134)	4,847,040 (8,976)	4,119,660 (7,629)	422,280 (782)	148,909,516 (199,565)

1/ These figures represent the total proper use grazing capacity for each grazing animal by allotment. Example: If the Bar X Allotment was grazed by cattle only, proper use would be 819 AUMs; grazed by sheep only, proper use would be 969 AUMs; grazed by pronghorn antelope only, proper use would be 626 AUMs; and so on. These figures were developed from the 1964-1965 Ocular Reconnaissance Range Survey which is available for review in the Rock Springs District Office. The methodology and an example are shown in APPENDIX 2I.

2/ Present actual use (see Glossary) in AUMs and pounds dry weight forage by animal class on each allotment. AUM figures for livestock correspond to TABLE 2-70.

3/ Present actual use in AUMs and pounds dry weight forage on each allotment. AUM figures for big game correspond to TABLE 2-36; AUMs for horses based on latest inventory figures (TABLE 2-58).

TABLE 2-25

PRESENT VEGETATION PRODUCTION IN POUNDS OF DRY WEIGHT FORAGE AND AUMS FOR EACH SPECIES BY CUSTODIAL PASTURE

Pasture Number	Total Production	Productivity Potential		Production by Class of Animal					
				Cattle		Sheep		Wild Horses	
	Pounds	Pounds	AUMs	Pounds	AUMs	Pounds	AUMs	Pounds	AUMs
C-1	35,308	15,600	20	6,240	8	7,500	10	0	0
C-2	31,605	10,140	13	3,120	4	3,750	5	0	0
C-3	94,668	54,600	70	8,580	11	9,000	12	0	0
C-4	37,164	75,660	97	2,340	3	3,750	5	0	0
C-5	99,840	133,380	171	14,820	19	7,500	10	0	0
C-6	203,020	425,880	546	30,420	39	17,250	23	0	0
C-7	176,280	224,640	288	24,960	32	15,000	20	0	0
C-8	207,326	222,300	285	40,560	52	43,500	58	0	0
C-9	354,291	432,120	554	65,520	84	62,520	83	0	0
C-10	432,485	556,140	713	65,520	84	62,520	83	0	0
C-11	785,280	538,980	691	89,700	115	88,500	118	0	0
C-12	102,053	74,100	95	21,840	28	20,250	27	0	0
C-13	56,925	36,660	47	13,260	17	12,750	17	0	0
C-14	9,875	7,800	10	1,560	2	1,500	2	0	0
C-15	1,291,844	850,980	1,091	214,500	275	234,750	313	0	0
C-16	113,170	68,640	88	19,500	25	21,750	29	0	0
C-17	224,663	112,320	144	24,180	31	37,500	50	0	0
C-18	102,088	73,320	94	12,480	16	17,250	23	0	0
C-19	171,733	117,000	150	24,960	32	29,250	39	0	0
C-20	21,725	17,160	22	3,120	4	3,750	5	0	0
C-21	959,825	720,720	924	164,580	211	182,250	243	0	0
C-22	195,294	108,420	139	41,340	53	25,500	34	0	0
C-23	186,522	97,500	125	33,540	43	26,250	33	0	0
C-24	1,494,149	750,360	962	258,960	332	207,750	277	0	0
C-25	750,270	768,300	985	102,960	132	114,750	153	0	0
C-26	741,740	838,500	1,075	138,060	177	120,750	161	0	0
C-27	385,004	401,700	515	65,520	84	63,750	85	0	0
C-28	400,254	294,060	377	84,240	108	55,500	74	0	0
C-29	298,013	201,240	258	52,260	67	54,000	72	0	0
C-30	1,186,080	1,045,980	1,341	177,060	227	196,500	262	0	0
C-31	425,233	762,060	977	74,100	95	79,500	106	0	0
C-32	55,660	130,260	167	10,140	13	10,500	14	0	0
C-33	32,868	23,400	30	3,900	5	6,000	8	0	0
CUSTODIAL PASTURE TOTALS	11,662,255	10,189,920	13,064	1,893,840	2,428	1,842,000	2,454	0	0

NOTE: These figures were developed from the 1964-1965 Ocular Reconnaissance Range Survey which is available for review in the Rock Springs District Office. Methodology and an example are shown in APPENDIX 2I.

TABLE 2-25 (Continued)

PRESENT VEGETATION PRODUCTION IN POUNDS OF DRY WEIGHT FORAGE AND AUMS FOR EACH SPECIES BY CUSTODIAL PASTURE

	Production in Pounds and AUMs								Pasture Totals	
Pasture Number	Pronghorn Antelope Pounds	Aums	Mule Deer Pounds	AUMs	Elk Pounds	Aums	Moose Pounds	AUMs	Pounds	AUMs
C-1	7,245	0	7,536	16	8,640	19	0	0	37,170	62
C-2	6,448	8	6,594	14	5,940	11	0	0	25,852	42
C-3	4,836	6	4,710	10	5,400	10	0	0	32,526	49
C-4	12,090	15	12,246	26	11,880	22	0	0	42,306	71
C-5	20,150	25	19,311	41	0	0	0	0	61,781	95
C-6	34,658	43	37,209	79	0	0	0	0	119,537	184
C-7	32,240	40	32,499	69	0	0	0	0	104,699	161
C-8	25,792	32	31,086	66	0	0	14,580	27	155,518	235
C-9	43,524	54	46,158	98	77,220	143	14,040	26	308,982	488
C-10	45,942	57	48,984	104	85,860	159	15,660	29	324,486	516
C-11	81,406	101	104,091	221	0	0	37,260	69	400,957	624
C-12	12,896	16	15,072	31	25,920	48	7,560	14	103,538	165
C-13	6,448	8	8,007	17	15,660	29	5,400	10	61,525	98
C-14	1,612	2	1,884	4	0	0	0	0	6,556	10
C-15	177,320	220	189,813	403	0	0	85,860	159	902,243	1,370
C-16	15,314	19	16,956	36	0	0	7,560	14	81,080	123
C-17	39,494	49	39,093	83	18,900	35	15,660	29	174,827	277
C-18	16,926	21	17,898	38	21,600	40	6,480	12	92,634	150
C-19	26,598	33	27,789	59	36,180	67	11,340	21	156,117	251
C-20	4.030	5	3,768	8	4,860	9	1,080	2	20,608	33
C-21	131,378	163	142,713	303	29,700	55	61,560	114	712,181	1,089
C-22	24,986	31	27,789	59	0	0	0	0	119,615	177
C-23	25,972	32	30,144	64	0	0	0	0	115,726	172
C-24	222,456	276	239,739	509	0	0	18,900	35	947,805	1,429
C-25	239,382	297	246,333	523	10,260	19	5,940	11	714,625	1,135
C-26	130,572	162	144,126	306	181,580	337	21,060	39	736,548	1,182
C-27	62,868	78	67,353	143	83,700	155	9,180	17	352,371	562
C-28	72,540	90	78,657	167	0	0	4,320	8	295,257	447
C-29	45,136	56	49,455	105	69,120	128	18,360	34	288,331	462
C-30	35,474	379	318,867	677	133,920	248	16,740	31	1,148,561	1,824
C-31	103,168	128	92,316	196	0	0	5,400	10	354,484	535
C-32	12,090	15	11,775	25	0	0	1,080	2	45,585	69
C-33	4,836	6	4,710	10	0	0	0	0	19,446	29
CUSTODIAL PASTURE TOTALS	1,995,656	2,476	2,124,681	4,511	826,740	1,534	385,020	713	9,068,477	14,116

TABLE 2-26

SUMMARY OF PRESENT VEGETATION PRODUCTION AND USE COMPARISON WITH POTENTIAL PRODUCTIVITY*

Allotment	Present Vegetal 1/ Production		Maximum Potential 2/ Productivity		Present Actual Use 3/	
	AUMs	Weight Forage	AUMs	Weight Forage	AUMs	Weight Forage
1. Bar X	819	638,820	2,755	8,367,980	1,105	861,900
2. Fish Creek	954	744,120	3,730	10,803,090	1,056	823,680
3. Gold Creek	4,110	3,205,800	20,606	81,759,637	5,791	4,516,980
4. Little Sandy-Little Prospect	15,142	11,810,760	50,688	165,286,832	25,290	19,726,200
5. Steamboat Mountain	2,097	1,635,660	12,421	38,631,491	1,995	1,556,100
6. Little Colorado						
a. Green River Use Area	16,852	13,144,560	49,796	145,718,850	13,831	10,788,180
b. Farson Use Area	13,002	10,141,560	36,173	80,729,887	3,187	2,485,860
c. Big Sandy Use Area	10,502	8,191,560	36,965	98,743,840	5,407	4,217,460
7. Red Desert	18,050	14,079,000	43,918	115,032,620	11,173	8,714,940
8. Bush Rim	6,452	5,032,560	26,950	79,355,754	4,190	3,268,200
9. Continental Peak	6,254	4,878,120	27,288	75,440,160	6,957	5,426,460
10. Pacific Creek	11,146	8,693,880	61,143	178,340,170	4,176	3,257,280
11. Sands	5,487	4,279,860	15,763	49,653,555	6,575	5,128,500
12. White Acorn	5,379	4,195,620	20,148	74,676,564	4,287	3,343,860
13. Prospect Mountain	5,300	4,134,000	24,917	89,721,348	8,638	6,737,640
14. Reservoir	1,720	1,341,600	8,015	17,431,838	2,615	2,039,700
15. Poston	3,453	2,693,340	8,065	106,072,216	2,380	1,856,400
16. Pine Creek	1,209	943,020	5,993	17,429,095	1,311	1,022,580
TOTALS	127,954	99,783,840	455,604	1,383,979,816	190,964	85,771,920

*This table represents an overall comparison of production and proper use within each allotment where all use by cattle, sheep, wild horses, and wildlife has been converted to cattle AUMs for an equivalent comparison. Maximum potential productivity is also included for comparative purposes.

1/ Present total proper cattle use forage production on a proper grazing capacity basis for each allotment, including custodial pastures (TABLES 2-24 and 2-25), according to 1964-1965 Ocular Reconnaissance Range Survey which is available for review in the Rock Springs District Office. Methodology and an example are shown in APPENDIX 2I.

2/ Maximum production possible on each allotment, by pasture, was developed by utilizing the methodology explained in APPENDIX 2I. The method used consists of correlation of vegetation types identified in 1964-65; soil mapping units developed for the Sandy area, and ecological range sites associated with those soil mapping units.

3/ Total present actual use by cattle, sheep, wild horses, and wildlife within each allotment. All use has been converted to a common denominator, cattle AUMs, for comparison purposes by dividing the dry weight forage in pounds for each allotment (TABLE 2-24) by 780 pounds, or the dry weight forage per cattle AUM.

TABLE 2-27

FORAGE PRODUCED FOR MAJOR ANIMAL SPECIES IN THE SANDY AREA

Species	AUMs*	Animal Months Provided**	Pounds of Forage Available
Cattle	125,500	125,500	97,890,000
Sheep	142,861	714,305	107,145,750
Wild Horses	93,560	93,560	84,204,000
Pronghorn	146,427	2,137,834	118,020,162
Deer	135,674	678,370	63,902,454
Elk	54,134	81,201	29,232,360
Moose	7,629	7,629	4,119,660

*These figures represent the amount the area could produce for each species individually.

**AUMs converted to animal months for each animal class, i.e. 5 sheep = 1 AU; 14.6 antelope = 1 AU; 5 deer = 1 AU; 1.5 elk = 1 AU; cattle, horse, and moose = 1 AU each. AU is the abbreviation for animal unit which is considered to be 1 mature cow.

TABLE 2-28

RANGE CONDITION IN ACRES FOR MAJOR ANIMAL SPECIES BY ALLOTMENT*

Allotment	Condition Rating **	Cattle	Sheep	Wild Horses	Pronghorn Antelope	Mule Deer	Elk	Moose
Bar X	Good	560	3,044	0	6,545	6,670	0	2,040
	Fair	2,966	3,851	0	350	225	0	824
	Poor	3,369	0	0	0	0	0	0
	Marginal/Use	0	0	6,895	0	0	6,895	4,031
Fish Creek	Good	0	0	0	5,755	6,545	0	3,600
	Fair	7,237	7,237	0	1,407	692	0	3,637
	Poor	0	0	0	75	0	0	0
	Marginal/Use	0	0	7,237	0	0	7,237	0
Gold Creek	Good	11,151	17,893	11,151	9,929	19,867	14,439	11,317
	Fair	11,061	11,503	11,061	18,983	9,866	8,040	17,928
	Poor	8,313	1,129	8,313	1,613	792	230	1,280
	Marginal/Use	0	0	0	0	0	7,816	0
Little Sandy/Little Prospect	Good	7,093	23,060	7,093	130,578	124,859	29,119	20,475
	Fair	133,124	152,134	133,124	47,383	55,534	11,081	22,510
	Poor	45,443	10,466	45,443	7,699	5,267	180	620
	Marginal/Use	0	0	0	0	0	145,280	142,055
Steamboat Mountain	Good	0	52	0	15,714	9,861	10,863	0
	Fair	31,908	38,872	31,908	24,489	22,841	27,882	0
	Poor	8,629	1,613	8,629	334	6,271	1,740	0
	Marginal/Use	0	0	0	0	1,564	52	40,537
Little Colorado: Green River Use Area	Good	47,032	140,713	47,032	179,036	37,683	0	3,182
	Fair	153,685	134,703	153,685	115,449	21,383	0	4,353
	Poor	103,078	28,379	103,078	9,310	3,434	0	8,732
	Marginal/Use	0	0	0	0	241,295	303,795	287,528
Little Colorado: Farson Use Area	Good	54,457	70,812	54,457	159,849	717	0	52
	Fair	66,961	106,830	66,961	37,490	333	0	282
	Poor	83,705	27,481	83,705	7,784	0	0	0
	Marginal/Use	0	0	0	0	204,073	205,123	204,789
Little Colorado: Big Sandy Use Area	Good	46,642	14,158	46,642	158,124	46,723	12,574	0
	Fair	138,469	201,477	138,469	58,059	14,495	7,321	0
	Poor	32,931	2,407	32,931	1,829	2,203	0	0
	Marginal/Use	0	0	0	0	154,621	198,147	218,042
Red Desert	Good	61,864	63,494	61,864	97,556	1,152	5,142	0
	Fair	150,473	166,810	150,473	97,083	205	20,508	0
	Poor	33,038	15,071	33,038	50,736	594	9,683	0
	Marginal/Use	0	0	0	0	243,424	210,022	245,375
Bush Rim	Good	4,676	20,367	4,676	45,326	32,298	16,329	0
	Fair	60,545	69,282	60,545	50,927	10,285	39,557	0
	Poor	39,326	14,898	39,326	8,294	17,683	8,413	0
	Marginal/Use	0	0	0	0	44,281	40,248	104,547
Continental Peak	Good	40,222	9,394	40,222	37,576	56,759	0	0
	Fair	46,822	78,802	46,822	49,826	16,436	1,204	0
	Poor	1,434	282	1,434	1,076	2,345	26	0
	Marginal/Use	0	0	0	0	12,938	87,248	88,478
Pacific Creek	Good	85,808	9,317	85,808	179,142	151,274	71,436	4,453
	Fair	88,292	190,605	88,292	21,846	39,983	28,592	6,833
	Poor	28,756	2,934	28,756	1,868	11,599	6,249	1,716
	Marginal/Use	0	0	0	0	0	96,579	189,854
Sands	Good	15,479	4,824	15,479	71,289	68,699	58,295	0
	Fair	52,723	91,447	52,723	42,282	43,081	37,223	0
	Poor	46,650	18,581	46,650	1,281	2,280	15,443	0
	Marginal/Use	0	0	0	0	792	3,891	114,852
White Acorn	Good	333	27,617	0	21,736	21,664	9,205	14,320
	Fair	36,495	21,013	0	21,565	21,215	3,744	17,848
	Poor	9,996	3,164	0	3,546	3,968	1,803	4,064
	Marginal/Use	0	0	46,794	0	0	32,095	10,615
Prospect Mountain	Good	205	4,971	0	40,461	47,402	9,977	24,283
	Fair	39,743	58,776	0	22,744	21,933	1,641	23,226
	Poor	26,803	3,004	0	3,546	2,416	774	2,334
	Marginal/Use	0	0	66,751	0	0	54,359	16,904
Reservoir	Good	2,278	7,474	0	31,514	21,938	0	1,960
	Fair	25,677	28,071	0	4,031	9,511	0	1,356
	Poor	7,590	0	0	0	0	0	308
	Marginal/Use	0	0	35,545	0	4,096	35,545	31,921
Poston	Good	5,992	15,396	0	39,318	23,258	0	2,188
	Fair	25,094	35,239	0	10,540	17,707	0	274
	Poor	19,549	0	0	777	87	0	110
	Marginal/Use	0	0	50,635	0	9,583	50,635	48,063
Pine Creek	Good	623	1,210	0	11,651	12,495	2,256	4,111
	Fair	13,466	12,879	0	1,978	1,082	0	9,978
	Poor	0	0	0	460	512	0	0
	Marginal/Use	0	0	14,089	0	0	11,833	0
TOTAL ACRES*	Good	384,415	428,796	374,474	1,241,099	684,864	239,634	91,980
	Fair	1,084,740	1,409,531	934,063	626,462	306,806	186,813	109,049
	Poor	498,577	129,405	431,303	100,171	59,451	44,541	19,168
	Marginal/Use	0	0	227,942	0	916,611	1,496,744	1,747,535
		1,967,732	1,967,732	1,967,737	1,967,732	1,967,732	1,967,732	1,967,732

*Figures do not include custodial pastures, Forest Service and USFWS withdrawals; and Palmer Draw wildlife area. Total acres differ from these in Chapter 1. Figures above are actual acres, while those in Chapter 1 are rounded off to the nearest five acres. (See APPENDIX 1A for further details.)

**Condition as applied to vegetation types, not ecological range sites.

TABLE 2-29

RANGE CONDITION IN ACRES FOR MAJOR ANIMAL SPECIES BY CUSTODIAL PASTURE

Pasture	Condition Rating	Cattle	Sheep	Wild Horses	Pronghorn Antelope	Mule Deer	Elk	Moose
C-1	Good	0	0	0	128	0	55	0
	Fair	158	0	158	132	260	0	0
	Poor	102	260	102	0	0	205	0
	Marginal/Use	0	0	0	0	0	0	260
C-2	Good	0	0	0	105	79	54	0
	Fair	0	0	0	0	26	51	0
	Poor	105	105	105	0	0	0	0
	Marginal/Use	0	0	0	0	0	0	105
C-3	Good	0	0	0	0	149	0	0
	Fair	215	215	215	215	66	215	0
	Poor	0	0	0	0	0	0	0
	Marginal/Use	0	0	0	0	0	0	215
C-4	Good	0	0	0	0	65	71	0
	Fair	80	90	80	90	25	19	0
	Poor	10	0	10	0	0	0	0
	Marginal/Use	0	0	0	0	0	0	90
C-5	Good	476	0	476	417	476	0	0
	Fair	0	476	0	59	0	0	0
	Poor	0	0	0	0	0	0	0
	Marginal/Use	0	0	0	0	0	476	476
C-6	Good	0	0	0	715	561	0	0
	Fair	612	715	612	0	144	0	0
	Poor	103	0	103	0	0	0	0
	Marginal/Use	0	0	0	0	0	715	715
C-7	Good	0	0	0	77	0	0	0
	Fair	570	570	570	493	570	0	0
	Poor	0	0	0	0	0	0	0
	Marginal/Use	0	0	0	0	0	570	570
C-8	Good	0	0	0	408	408	0	102
	Fair	408	408	0	0	0	0	306
	Poor	0	0	0	0	0	0	0
	Marginal/Use	0	0	408	0	0	408	0
C-9	Good	673	673	673	673	673	673	25
	Fair	0	0	0	0	0	0	418
	Poor	0	0	0	0	0	0	230
	Marginal/Use	0	0	0	0	0	0	0
C-10	Good	402	733	402	0	0	415	102
	Fair	331	0	331	733	733	318	631
	Poor	0	0	0	0	0	0	0
	Marginal/Use	0	0	0	0	0	0	0
C-11	Good	0	0	0	362	915	0	0
	Fair	915	915	0	553	0	0	915
	Poor	0	0	0	0	0	0	0
	Marginal/Use	0	0	915	0	0	915	0
C-12	Good	0	52	0	0	0	52	0
	Fair	190	112	0	190	190	138	113
	Poor	0	26	0	0	0	0	77
	Marginal/Use	0	0	190	0	0	0	0
C-13	Good	0	100	0	0	26	74	0
	Fair	100	0	0	26	74	26	100
	Poor	0	0	0	74	0	0	0
	Marginal/Use	0	0	100	0	0	0	0
C-14	Good	0	0	0	25	0	0	0
	Fair	25	25	25	0	25	0	0
	Poor	0	0	0	0	0	0	0
	Marginal/Use	0	0	0	0	0	25	25
C-15	Good	0	256	0	800	673	0	410
	Fair	2,202	2,510	2,202	936	1,658	0	1,943
	Poor	564	0	564	1,030	435	0	413
	Marginal/Use	0	0	0	0	0	2,766	0

TABLE 2-29 (Continued)

RANGE CONDITION IN ACRES FOR MAJOR ANIMAL SPECIES BY CUSTODIAL PASTURE

Pasture	Condition Rating	Cattle	Sheep	Wild Horses	Pronghorn Antelope	Mule Deer	Elk	Moose
C-16	Good	0	0	0	0	0	0	0
	Fair	99	235	99	78	47	0	209
	Poor	136	0	136	157	188	0	26
	Marginal/Use	0	0	0	0	0	235	0
C-17	Good	0	103	0	289	426	154	404
	Fair	430	442	430	256	119	65	91
	Poor	115	0	115	0	0	0	0
	Marginal/Use	0	0	0	0	0	326	50
C-18	Good	0	0	0	77	0	0	208
	Fair	260	260	0	183	260	260	52
	Poor	0	0	0	0	0	0	0
	Marginal/Use	0	0	260	0	0	0	0
C-19	Good	0	0	0	293	293	395	51
	Fair	52	395	52	0	102	0	344
	Poor	343	0	343	102	0	0	0
	Marginal/Use	0	0	0	0	0	0	0
C-20	Good	0	0	0	18	55	55	55
	Fair	0	55	0	0	0	0	0
	Poor	55	0	55	37	0	0	0
	Marginal/Use	0	0	0	0	0	0	0
C-21	Good	0	0	0	1,463	1,975	66	699
	Fair	640	1,641	640	512	0	0	1,276
	Poor	1,335	334	1,335	0	0	154	0
	Marginal/Use	0	0	0	0	0	1,755	0
C-22	Good	0	0	0	255	77	0	0
	Fair	255	255	0	0	178	0	0
	Poor	0	0	0	0	0	0	0
	Marginal/Use	0	0	255	0	0	255	255
C-23	Good	0	26	0	350	350	0	0
	Fair	350	324	0	0	0	0	0
	Poor	0	0	0	0	0	0	0
	Marginal/Use	0	0	350	0	0	350	350
C-24	Good	0	120	0	1,263	1,110	0	1,392
	Fair	1,832	2,122	0	981	1,081	0	520
	Poor	410	0	0	0	51	0	330
	Marginal/Use	0	0	2,242	0	0	2,242	0
C-25	Good	0	0	0	3,210	3,210	3,159	1,701
	Fair	0	3,210	0	0	0	0	1,509
	Poor	3,210	0	0	0	0	0	0
	Marginal/Use	0	0	3,210	0	0	51	0
C-26	Good	0	0	0	307	2,041	1,965	625
	Fair	0	1,186	0	2,195	128	0	1,877
	Poor	2,630	1,444	0	128	461	358	128
	Marginal/Use	0	0	2,630	0	0	307	0
C-27	Good	0	0	0	493	128	0	128
	Fair	801	154	0	186	52	97	679
	Poor	409	1,056	0	531	1,030	0	0
	Marginal/Use	0	0	1,210	0	0	1,113	403
C-28	Good	0	0	0	880	880	0	854
	Fair	0	880	0	0	0	0	0
	Poor	880	0	0	0	0	0	0
	Marginal/Use	0	0	880	0	0	880	26
C-29	Good	0	0	0	0	760	760	26
	Fair	0	760	0	760	0	0	734
	Poor	760	0	0	0	0	0	0
	Marginal/Use	0	0	760	0	0	0	0
C-30	Good	0	0	0	3,127	4,360	1,489	2,128
	Fair	0	4,360	0	1,233	0	0	1,208
	Poor	4,360	0	0	0	0	0	0
	Marginal/Use	0	0	4,360	0	0	2,871	1,024
C-31	Good	0	1,685	0	0	0	0	816
	Fair	0	0	0	1,685	1,659	0	0
	Poor	1,685	0	1,685	0	26	0	869
	Marginal/Use	0	0	0	0	0	1,685	0

TABLE 2-29 (Continued)

RANGE CONDITION IN ACRES FOR MAJOR ANIMAL SPECIES BY CUSTODIAL PASTURE

Pasture	Condition Rating	Cattle	Sheep	Wild Horses	Pronghorn Antelope	Mule Deer	Elk	Moose
C-32	Good	0	0	0	102	77	0	220
	Fair	0	220	0	118	143	0	0
	Poor	220	0	220	0	0	0	0
	Marginal/Use	0	0	0	0	0	220	0
C-33	Good	0	0	0	26	90	0	90
	Fair	90	90	90	64	0	0	0
	Poor	0	0	0	0	0	0	0
	Marginal/Use	0	0	0	0	0	90	0
TOTAL ACRES*	Good	1,552	3,748	1,552	15,864	19,860	9,436	10,036
	Fair	10,615	22,625	5,504	11,677	7,549	1,170	12,927
	Poor	17,431	3,225	4,773	2,057	2,189	717	2,074
	Marginal/Use	0	0	17,769	0	0	18,275	4,561
		29,598	29,598	29,598	29,598	29,598	29,598	29,598

*Total acres differ from those of Chapter 1. Figures above are actual acres, while those in Chapter 1 are rounded off to the nearest 5 acres. (See APPENDIX 1C for further details.)

TABLE 2-30

RANGE CONDITION IN ACRES BY ALLOTMENT FOR BIG GAME CRUCIAL HABITAT

	Pronghorn Antelope				Mule Deer				Elk				Moose			
	Acres of Crucial	Range Condition			Acres of Crucial	Range Condition			Acres of Crucial	Range Condition			Acres of Crucial	Range Condition		
Allotment	Habitat	Good	Fair	Poor	Habitat	Good	Fair	Poor	Habitat	Good	Fair	Poor	Habitat	Good	Fair	Poor
Bar X	0				0				0	0	0	0	4,147	1,664	2,483	0
Fish Creek	0				0				0	0	0	0	3,482	896	2,586	0
Gold Creek					0				3,917	640	3,277	0	6,682	2,150	4,532	0
Little Sandy-Little Pro-spect	29,440	15,640	13,800	0	119,936	71,040	47,718	1,178	51,072	38,425	12,647	0	40,371	23,859	16,512	0
Steamboat Mountain	0				16,742	2,509	11,366	2,867	21,786	3,328	15,796	2,662	0			
Little Colorado	98,480	90,405	8,075	0	0				0	0	0	0	12,672	4,173	2,483	6,016
Red Desert	0				0				38,088	5,709	24,061	8,318	0			
Bush Rim	0				1,536	0	640	896	50,560	26,318	20,812	3,430	0			
Contin-ental Peak	0				0				0	0	0	0	307	0	307	0
Pacific Creek	39,040	35,740	3,200	100	33,459	17,050	11,622	4,787	36,966	20,429	14,694	1,843	13,050	4,274	7,882	894
Sands	34,240	25,344	8,845	51	24,602	21,402	2,918	282	11,520	9,779	563	1,178	0			
White Acorn	0				0				3,354	1,869	1,485	0	24,090	14,311	9,651	128
Prospect Mountain	0				44,160	29,133	12,749	2,278	9,242	8,679	563	0	13,030	8,985	3,840	205
Reservoir	12,800	12,200	600	0	0				0	0	0	0	4,605	2,277	1,534	794
Poston	0				9,549	6,144	3,405	0	0	0	0	0	6,424	4,888	998	538
Pine Creek	0				0				0	0	0	0	3,072	998	2,074	0
	214,000	179,329	34,520	151	249,984	147,278	90,418	12,288	226,505	115,176	93,898	17,431	131,932	68,475	54,882	8,575

TABLE 2-31

APPARENT RANGE TREND IN ACRES FOR MAJOR ANIMAL SPECIES BY ALLOTMENT*

Allotment	Trend Rating **	Cattle	Sheep	Wild Horses	Pronghorn Antelope	Mule Deer	Elk	Moose
Bar X	Upward	0	0	0	2,393	5,881	0	26
	Static	6,895	6,895	0	4,502	962	0	4,220
	Down	0	0	0	0	52	0	0
	Marginal Use	0	0	6,895	0	0	6,895	2,649
Fish Creek	Upward	0	0	0	256	256	0	2,785
	Static	6,715	6,260	0	6,981	6,676	0	3,584
	Down	522	977	0	0	305	0	868
	Marginal Use	0	0	7,237	0	0	7,237	0
Gold Creek	Upward	21,940	21,632	21,930	11,989	12,679	12,253	6,957
	Static	8,585	8,893	8,595	17,282	16,693	10,485	20,873
	Down	0	0	0	1,254	1,153	0	2,695
	Marginal Use	0	0	0	0	0	7,787	0
Little Sandy-Little Prospect	Upward	2,919	2,637	2,919	49,459	89,293	14,564	11,540
	Static	182,741	183,023	182,741	127,198	93,729	32,358	34,426
	Down	0	0	0	9,003	2,638	3,713	1,894
	Marginal Use	0	0	0	0	0	135,025	137,800
Steamboat Mountain	Upward	7,497	0	7,497	5,057	8,685	11,218	0
	Static	33,040	16,733	33,040	33,458	30,466	29,319	0
	Down	0	0	0	2,022	0	0	0
	Marginal Use	0	23,804	0	0	1,386	0	40,537
Little Colorado:								
Green River Use Area	Upward	5,632	6,938	5,632	13,107	7,003	0	0
	Static	204,471	230,816	204,471	283,881	51,851	0	10,605
	Down	93,692	66,041	93,692	6,807	1,685	0	563
	Marginal Use	0	0	0	0	243,256	303,795	292,627
Farson Use Area	Upward	17,373	51,714	17,373	40,671	0	0	77
	Static	175,513	134,034	175,513	157,030	4,469	0	1,612
	Down	12,237	19,375	12,237	7,422	0	0	0
	Marginal Use	0	0	0	0	200,654	205,123	203,434
Big Sandy Use Area	Upward	794	0	794	43,578	9,395	2,098	0
	Static	210,874	213,793	210,874	172,948	49,366	19,253	0
	Down	6,374	4,249	6,374	1,513	2,438	0	0
	Marginal Use	0	0	0	3	156,843	196,691	218,042
Red Desert	Upward	152,668	83,274	152,668	76,419	640	5,580	0
	Static	92,707	162,101	92,707	166,474	1,184	33,008	0
	Down	0	0	0	2,482	0	0	0
	Marginal Use	0	0	0	0	243,551	206,787	245,375
Bush Rim	Upward	68,599	72,821	68,599	28,068	15,066	17,510	0
	Static	35,948	31,726	35,948	70,240	37,463	42,393	0
	Down	0	0	0	6,239	3,406	3,856	0
	Marginal Use	0	0	0	0	48,612	40,788	104,547
Continental Peak	Upward	1,280	0	1,280	15,615	35,692	0	0
	Static	87,198	88,478	87,198	72,121	42,374	1,254	0
	Down	0	0	0	742	512	0	0
	Marginal Use	0	0	0	0	9,900	87,224	88,478
Pacific Creek	Upward	34,771	11,229	34,771	94,499	100,596	28,632	6,038
	Static	166,370	191,627	166,370	105,700	101,441	73,785	8,236
	Down	1,715	0	1,715	2,657	819	0	0
	Marginal Use	0	0	0	0	0	100,439	188,582
Sands	Upward	18,827	2,432	18,827	54,319	64,992	55,434	0
	Static	54,707	98,751	54,707	59,740	48,504	42,684	0
	Down	41,318	13,669	41,318	793	972	999	0
	Marginal Use	0	0	0	0	384	15,735	114,852
White Acorn	Upward	3,437	3,091	0	8,806	9,465	10,581	10,657
	Static	43,410	43,756	0	36,016	35,114	4,123	25,984
	Down	0	0	0	2,025	2,268	0	230
	Marginal Use	0	0	46,847	0	0	32,143	9,976
Prospect Mountain	Upward	17,066	17,675	0	18,970	33,157	3,119	9,959
	Static	45,216	45,815	0	45,724	30,896	9,567	36,705
	Down	4,469	3,261	0	2,057	2,698	154	2,519
	Marginal Use	0	0	66,751	0	0	53,911	17,568

TABLE 2-31 (Continued)

APPARENT RANGE TREND IN ACRES FOR MAJOR ANIMAL SPECIES BY ALLOTMENT*

Allotment	Trend Rating**	Cattle	Sheep	Wild Horses	Pronghorn Antelope	Mule Deer	Elk	Moose
Reservoir	Upward	0	0	0	4,244	5,900	0	1,663
	Static	35,545	35,545	0	29,816	26,727	0	2,914
	Down	0	0	0	1,485	0	0	153
	Marginal Use	0	0	35,545	0	2,918	35,545	30,815
Poston	Upward	0	0	0	23,069	23,708	0	820
	Static	50,570	50,567	0	27,566	20,166	0	3,688
	Down	65	68	0	0	0	0	26
	Marginal Use	0	0	50,635	0	6,761	50,635	46,101
Pine Creek	Upward	12,446	502	0	10,129	3,667	1,305	4,64[illegible]
	Static	1,643	13,587	0	3,481	10,020	0	8,959
	Down	0	0	0	479	402	0	486
	Marginal Use	0	0	14,089	0	0	12,784	0
TOTAL ACRES*	Upward	365,249	273,945	332,290	500,648	426,075	162,294	55,166
	Static	1,442,148	1,562,400	1,252,164	1,420,158	608,101	298,229	161,80[illegible]
	Downward	160,335	107,640	155,336	46,923	19,348	8,722	9,43[illegible]
	Marginal Use	0	23,747	227,942	3	914,208	1,498,487	1,741,32[illegible]
		1,967,732	1,967,732	1,967,732	1,967,732	1,937,732	1,967,732	1,967,732

* Figures exclude custodial pastures; Forest Service and USFWS withdrawals; and Palmer Draw wildlife area. Total acres differ from those in Chapter 1. Figures above are actual acres, while those in Chapter 1 are rounded off to the nearest 5 acres.

** Apparent trend as applied to vegetation types, not ecological range sites.

TABLE 2-32

APPARENT RANGE TREND IN ACRES FOR MAJOR ANIMAL SPECIES BY CUSTODIAL PASTURE

Pasture	Trend Rating	Cattle	Sheep	Wild Horses	Pronghorn Antelope	Mule Deer	Elk	Moose
C-1	Upward	0	0	0	260	260	0	0
	Static	260	132	260	0	0	128	0
	Downward	0	128	0	0	0	0	0
	Marginal Use	0	0	0	0	0	132	260
C-2	Upward	0	0	0	105	105	105	0
	Static	105	28	105	0	0	0	0
	Downward	0	77	0	0	0	0	0
	Marginal Use	0	0	0	0	0	0	105
C-3	Upward	0	0	0	0	77	215	0
	Static	215	215	215	215	138	0	0
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	0	0	0	0	215
C-4	Upward	0	0	0	0	90	90	0
	Static	90	90	90	19	0	0	0
	Downward	0	0	0	71	0	0	0
	Marginal Use	0	0	0	0	0	0	90
C-5	Upward	0	0	0	26	26	0	0
	Static	476	476	476	450	450	0	26
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	0	0	0	476	450
C-6	Upward	0	0	0	281	0	0	0
	Static	715	715	715	434	715	0	0
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	0	0	0	715	715
C-7	Upward	0	0	0	0	0	0	0
	Static	570	570	570	570	570	0	0
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	0	0	0	570	570
C-8	Upward	408	0	0	408	0	0	156
	Static	0	408	0	0	408	0	252
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	408	0	0	408	0
C-9	Upward	673	673	673	0	673	545	0
	Static	0	0	0	673	0	128	101
	Downward	0	0	0	0	0	0	572
	Marginal Use	0	0	0	0	0	0	0
C-10	Upward	733	733	733	0	733	191	0
	Static	0	0	0	733	0	542	451
	Downward	0	0	0	0	0	0	282
	Marginal Use	0	0	0	0	0	0	0
C-11	Upward	0	0	0	26	553	0	0
	Static	915	915	0	889	362	0	889
	Downward	0	0	0	0	0	0	26
	Marginal Use	0	0	915	0	0	915	0
C-12	Upward	26	0	0	0	0	0	0
	Static	164	190	0	190	190	190	190
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	190	0	0	0	0
C-13	Upward	0	0	0	0	0	0	0
	Static	100	100	0	100	100	100	100
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	100	0	0	0	0
C-14	Upward	0	0	0	25	0	0	0
	Static	25	25	25	0	0	0	0
	Downward	0	0	0	0	25	0	0
	Marginal Use	0	0	0	0	0	25	25
C-15	Upward	0	0	0	154	717	0	615
	Static	2,766	2,766	2,766	2,612	1,997	0	2,151
	Downward	0	0	0	0	52	0	0
	Marginal Use	0	0	0	0	0	2,766	0
C-16	Upward	0	0	0	0	0	0	26
	Static	235	235	235	235	235	0	209
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	0	0	0	235	0
C-17	Upward	0	0	0	0	179	0	205
	Static	545	545	545	545	366	269	340
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	0	0	0	276	0
C-18	Upward	0	0	0	0	0	0	103
	Static	260	260	260	260	260	260	0
	Downward	0	0	0	0	0	0	157
	Marginal Use	0	0	0	0	0	0	0
C-19	Upward	0	0	0	369	293	0	0
	Static	395	395	395	26	102	370	395
	Downward	0	0	0	0	0	25	0
	Marginal Use	0	0	0	0	0	0	0

TABLE 2-32 (Continued)

APPARENT RANGE TREND IN ACRES FOR MAJOR ANIMAL SPECIES BY CUSTODIAL PASTURE

Pasture	Trend Rating	Cattle	Sheep	Wild Horses	Pronghorn Antelope	Mule Deer	Elk	Moose
C-20	Upward	0	0	0	0	55	0	0
	Static	55	55	55	29	0	0	55
	Downward	0	0	0	26	-0	55	0
	Marginal Use	0	0	0	0	0	0	0
C-21	Upward	1,514	104	1,514	256	640	435	410
	Static	461	1,871	461	1,514	1,335	0	0
	Downward	0	0	0	205	0	0	1,565
	Marginal Use	0	0	0	0	0	1,540	0
C-22	Upward	0	0	0	229	229	0	0
	Static	255	255	0	26	26	0	0
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	255	0	0	255	255
C-23	Upward	0	0	0	0	350	0	0
	Static	350	350	0	350	0	0	0
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	350	0	0	350	350
C-24	Upward	0	0	0	0	1,227	0	0
	Static	2,242	2,242	0	2,242	1,015	0	2,242
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	2,242	0	0	2,242	0
C-25	Upward	0	0	0	461	3,005	0	0
	Static	3,210	3,210	0	2,083	205	3,084	3,210
	Downward	0	0	0	666	0	0	0
	Marginal Use	0	0	3,210	0	0	126	0
C-26	Upward	2,630	2,297	0	461	881	2,067	1,032
	Static	0	333	0	2,169	1,749	102	1,419
	Downward	0	0	0	0	0	0	179
	Marginal Use	0	0	2,630	0	0	461	0
C-27	Upward	1,210	1,056	0	614	1,082	479	871
	Static	0	154	0	596	128	314	313
	Downward	0	0	0	0	0	0	26
	Marginal Use	0	0	1,210	0	0	417	0
C-28	Upward	0	0	0	675	582	0	684
	Static	803	880	0	205	298	0	99
	Downward	77	0	0	0	0	0	0
	Marginal Use	0	0	880	0	0	880	97
C-29	Upward	760	760	0	760	26	734	760
	Static	0	0	0	0	734	26	0
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	760	0	0	0	0
C-30	Upward	4,027	4,002	0	4,360	3,049	0	3,285
	Static	333	358	0	0	1,311	1,720	0
	Downward	0	0	0	0	0	0	0
	Marginal Use	0	0	4,360	0	0	2,640	1,075
C-31	Upward	0	0	0	0	0	0	0
	Static	0	0	0	895	1,377	0	1,378
	Downward	1,685	1,685	1,685	790	308	0	307
	Marginal Use	0	0	0	0	0	1,685	0
C-32	Upward	0	0	0	0	0	0	0
	Static	0	0	0	220	220	0	220
	Downward	220	220	220	0	0	0	0
	Marginal Use	0	0	0	0	0	220	0
C-33	Upward	0	0	0	0	90	0	0
	Static	90	90	90	90	0	0	26
	Downward	0	0	0	0	0	0	64
	Marginal Use	0	0	0	0	0	90	0
	Upward	11,983	9,625	2,920	9,470	14,922	4,861	8,147
	Static	15,633	17,863	7,263	18,370	14,291	7,233	14,066
	Downward	1,982	2,110	1,905	1,758	385	80	3,178
	Marginal Use	0	0	17,510	0	0	17,424	4,207
TOTAL ACRES*		29,598	29,598	29,598	29,598	29,598	29,598	29,598

* Acres have been rounded; see APPENDIX 1C.

TABLE 2-33

APPARENT RANGE TREND IN ACRES FOR BIG GAME CRUCIAL HABITAT BY ALLOTMENT

Allotment	Pronghorn Antelope: Acres of Crucial Habitat	Pronghorn Antelope: Apparent Range Trend Upward	Static	Downward	Mule Deer: Acres of Crucial Habitat	Mule Deer: Apparent Range Trend Upward	Static	Downward
Bar X	0				0			
Fish Creek	0				0			
Gold Creek	0				0			
Little Sandy-Little Prospect	29,440	11,140	18,300	0	119,936	56,422	62,080	1,434
Steamboat Mountain	0				16,742	3,686	13,056	0
Little Colorado	98,480	38,288	60,192		0			
Red Desert	0				0			
Bush Rim	0				1,536	0	1,536	0
Continental Peak	0				0			
Pacific Creek	39,040	28,040	11,000		33,459	5,427	28,032	0
Sands	34,240	14,925	19,315		24,602	19,686	4,839	77
White Acorn	0				0			
Prospect Mountain	0				44,160	21,965	19,917	2,278
Reservoir	12,800	1,410	11,390	0	0			0
Poston	0				9,549	5,453	4,096	0
Pine Creek	0				0			
	214,000	93,803	120,197	0	249,984	112,639	133,556	3,789

Allotment	Elk: Acres of Crucial Habitat	Elk: Apparent Range Trend Upward	Static	Downward	Moose: Acres of Crucial Habitat	Moose: Apparent Range Trend Upward	Static	Downward
Bar X	0	0	0	0	4,147	3,943	102	102
Fish Creek	0	0	0	0	3,482	768	2,612	102
Gold Creek	3,917	870	3,047	0	6,682	973	5,709	0
Little Sandy-Little Prospect	51,072	17,639	29,567	3,866	40,371	6,451	32,512	1,408
Steamboat Mountain	21,786	3,738	18,048	0	0			
Little Colorado	0	0	0	0	12,672	0	12,006	666
Red Desert	38,088	6,910	31,178	0	0			
Bush Rim	50,560	18,074	29,798	2,688	0			
Continental Peak	0	0	0	0	307	0	307	0
Pacific Creek	36,966	11,853	25,113	0	13,050	5,938	7,112	0
Sands	11,520	11,136	384	0	0			
White Acorn	3,354	2,714	0	640	24,090	5,043	18,740	307
Prospect Mountain	9,242	0	9,114	128	13,030	3,481	9,267	282
Reservoir	0	0	0	0	4,605	358	3,223	1,024
Poston	0	0	0	0	6,424	666	5,650	108
Pine Creek	0	0	0	0	3,072	691	2,381	0
	226,505	72,934	146,249	7,322	131,932	28,312	99,621	3,999

TABLE 2-34

ANIMAL SPECIES REPRESENTATIVE OF THE SANDY AREA, LISTED ACCORDING TO SIMILARITIES IN HABITAT REQUIREMENTS, HABITS, OR LIFE FORM*

GROUP 1	In the study area, these animals are heavily dependent upon sagebrush for food or cover or nesting sites or combination thereof and/or other upland shrubs such as greasewood, saltbush and rabbitbrush, especially for winter feed.	Pronghorn Antelope Mule Deer Elk Sagebrush Vole Deer Mouse Least Chipmunk White-tailed Prairie Dog White-tailed Jack Rabbit Desert Cottontail Sage Grouse Sage Sparrow Lark Sparrow Brewer's Sparrow Sage Thrasher Lazuli Bunting Green-tailed Towhee Flycatcher, spp. Sagebrush Lizard
GROUP II	In the study area, these animals feed heavily on seeds and/or foliage or roots of weedy species of forb or annual grasses and/or nest on ground in open grasslands.	Northern Grasshopper Mouse Thirteen-lined Ground Squirrel Richardson's Ground Squirrel Northern Pocket Gopher Ord's Kangaroo Rat Gray-Crowned Rosy Finch Mourning Dove Lark Bunting Savannah Sparrow Grasshopper Sparrow Vesper Sparrow Horned Lark
GROUP III	In the study area, these animals nest on the ground in open grasslands and/or feed primarily on perennial grass seeds or foliage.	Prairie Vole Chestnut Collared Longspur McCown's Longspur
GROUP IV	In the study area, these animals depend primarily on the riparian (streamside) plant associations and/or marshy or moist meadow areas around lakes or ponds to directly or indirectly provide food or cover or nesting or breeding sites or combinations thereof.	Raccoon Mink Striped Skunk Beaver Muskrat Water Shrew Long-tailed Vole Black-billed Magpie Red-shafted Flicker Wilson's Snipe Eastern Kingbird Traill's Flycatcher Goldfinch Catbird Long-billed Marsh Wren Brown Thrasher Robin Yellow Warbler Yellowthroat Long-tailed Chat Brown-headed Cowbird Wandering Garter Snake
GROUP V	In the study area these animals usually require the open pine timber, juniper breaks or rough, rocky topography for cover or food or nesting sites or a combination thereof.	Mountain Cottontail Elk Bushy-tailed Wood Rat Porcupine Pygmy Nuthatch Pinon Jay Pika Yellow-bellied marmot
GROUP VI	The composition of insect and spider populations and relative abundance of different taxonomic groups vary with season, vegetation type and stage of succession. There is generally a greater variety of species and a greater abundance of individuals in the intermediate stages of grassland succession than in either the early or climax stages. Invertebrates are one of the three major groups of grazing animals.	Invertebrates, including a wide variety of insect families and spiders such as: Springtails Long-horned Grasshopper Short-horned Grasshopper Barklice Thrips Plant Bugs Lace Bugs Seed Bugs Leafhoppers Aphids Ground Beetles Carrion Bettles Dermestid Beetles Darkling Beetles Snout Beetles Moths Midges Mosquitoes Wasps Ants Harvestmen Wolf Spiders Orb Weaver Spiders
GROUP VII	These animals are all highly insectivorous, if not totally so; their presence, density, and distribution is significantly influenced by the status of local insect populations.	Long-eared Myotis Little Brown Bat Vagrant Shrew Masked Shrew Grasshopper Mouse Common Nighthawk Western Kingbird Say's Phoebe Bank Swallow Cliff Swallow Eastern Bluebird Mountain Bluebird Northern Shrike Loggerhead Shrike Starling Meadowlark Short-horned Lizard
GROUP VIII	Members of these animal groups found within the study area exhibit from high to total dependence upon stream, lake, or pond-marsh biotic communities for continued existence.	Waterfowl, Shorebirds Amphibians, and Fish: Grebes Herons Geese Ducks Sandpipers Snipe Avocets Phalaropes Salamanders Frogs Toads Trouts Minnows Suckers

TABLE 2-34 (Continued)

ANIMAL SPECIES REPRESENTATIVE OF THE SANDY AREA, LISTED ACCORDING TO SIMILARITIES IN HABITAT REQUIREMENTS, HABITS, OR LIFE FORM*

GROUP VI These animals are somewhat wide-ranging and/or highly flexible predators. They prey, to varying extents, on members of most other groups. Their presence, abundance, and distribution are influenced primarily by availability of prey species; in some species, their presence is strongly influenced by the availability of nesting, trees, den sites, or burrows.	Coyote Red Fox Bobcat Long-tailed Weasel Black-footed Ferret** Badger Great Horned Owl Burrowing Owl Long-eared Owl Short-eared Owl Cooper's Hawk Red-tailed Hawk Swainson's Hawk Rough-legged Hawk Ferruginous Hawk Bald Eagle Golden Eagle Marsh Hawk Prairie Falcon Sparrow Hawk Peregrine Falcon** Lynx** Great Basin Gopher Snake**

*Sources: Ecology Consultants, Inc. 1976a, 1976b and 1976c; BLM 1974.

**These animals are known to have occurred in the Sandy area; however, because of their scarcity, they cannot be considered as representative fauna.

TABLE 2-35

OCCURRENCE OF SELECTED IMPORTANT WILDLIFE SPECIES

Species	Season of Use
1. Peregrine Falcon	Y (Resident and Migrant)
2. Prairie Falcon	Y (Resident and Migrant)
3. Black-Footed Ferret	Y (Resident)
4. Western Burrowing Owl	S (Migrant)
5. Pronghorn Antelope	Y (Resident)
6. Mule Deer	Y (Resident)
7. Elk	Y (Resident)
8. Shiras Moose	Y (Resident)
9. Sage Grouse	Y (Resident)
10. Ducks	S (Migrant)
11. Coyote	Y (Resident)
12. Golden Eagle	Y (Resident and Migrant)
13. White-Tailed Prairie Dog	Y (Resident)
14. Cottontail Rabbit	Y (Resident)
15. Mourning Dove	Y (Resident and Migrant)
16. Bobcat	Y (Resident)
17. Horned Lark	Y (Resident)
18. Richardson Ground Squirrel	Y (Resident)
19. White-Tailed Jackrabbit	Y (Resident)
20. Beaver	Y (Resident)

Y-Yearlong
S-Seasonal

those expected to occur. Allen (1961) indicates inherent problems in wildlife habitat management when he writes:

"As if the ordinary difficulties of management were not enough, there are causes for wildlife scarcities that go beyond such things as cover, food, overshooting, etc. Unless they realize this and are prepared for it, the hunter and technician are going to be disillusioned and lose faith in the very things that are working for them"

"We have examined the waxing and waning of animal numbers with the seasons and in a few cases we have seen the mechanism at work. A striking consistency in production is evident where habitat are, for a time, free from extreme variability in important conditions"

"But it is well known that such variability does occur. Weather is a proverbially undependable, and it affects animal populations in a multitude of ways. Also, there are long-term population changes, some of which appear to be regular and predictable as gross trends over large regions. Whether these 'cycles' are real or only apparent is a perplexing subject that has furrowed many a scientific brow"

Big Game

Pronghorn antelope, mule deer, elk, and moose are the major big game species found in the Sandy area. The Wyoming Game and Fish Department currently manages these animals on a hunt area-herd unit basis (MAP 2-21).

Pronghorn Antelope. The pronghorn is the most numerous and conspicuous of the area's big game animals. TABLE 2-36 displays the current population estimates for each allotment; TABLE 2-37 gives the desired populations.

There are annual and seasonal variations in pronghorn population densities on the delineated ranges in the Sandy area. Populations vary according to the availability and distribution of forage, cover, and water; weather conditions; population size; interspecific interactions; and/or other factors (Wyoming Game and Fish Department 1976). Therefore, estimated numbers in TABLE 2-36 are not fixed but vary each year and each season. The figures do provide an estimate of average forage consumed by the pronghorn in each allotment. Pronghorn populations currently are increasing after having suffered heavy mortality during the severe winter of 1971-72 (Oakley and Riddle 1972).

The Wyoming Game and Fish Department allows antelope hunting each year to manage population levels. Average hunt harvest information is given in the recreation section for hunt areas which include portions of the Sandy area (MAP 2-21).

The Sandy area in general is considered summer habitat for antelope. During normal winters, they congregate in the Farson-Eden area and a small portion of the Sands Allotment (MAP 2-22, located at the end of this chapter). During harsh winters, they tend to winter farther south in the Little Colorado Allotment. During dry, mild winters, they expand the wintering area in all directions. The winter use areas are considered crucial habitat for pronghorn (TABLE 2-38). Of the several vegetation types used by pronghorn, sagebrush-grass is the most abundant (TABLE 2-39).

Food. Sagebrush is the most heavily used forage species, especially during the winter months (Taylor 1975). Pronghorn use a high amount of forbs in spring, but use progressively declines from summer to winter (TABLE 2-40); grass is eaten in small amounts. The amount and quality of winter browse availability determines pronghorn carrying capacity of the area (Taylor 1975).

Pronghorn have a diet overlap with livestock grazing in the Sandy area. A fecal analysis study is being conducted on samples collected in the Red Desert area by the BLM and Colorado State University to determine the overlap between wild horses, antelope, sheep, cattle, and elk. The results after one year support previous findings that cattle and horses have little diet overlap with antelope. Sheep have an overlap of 21% during the year with much seasonal variation (TABLE 2-41).

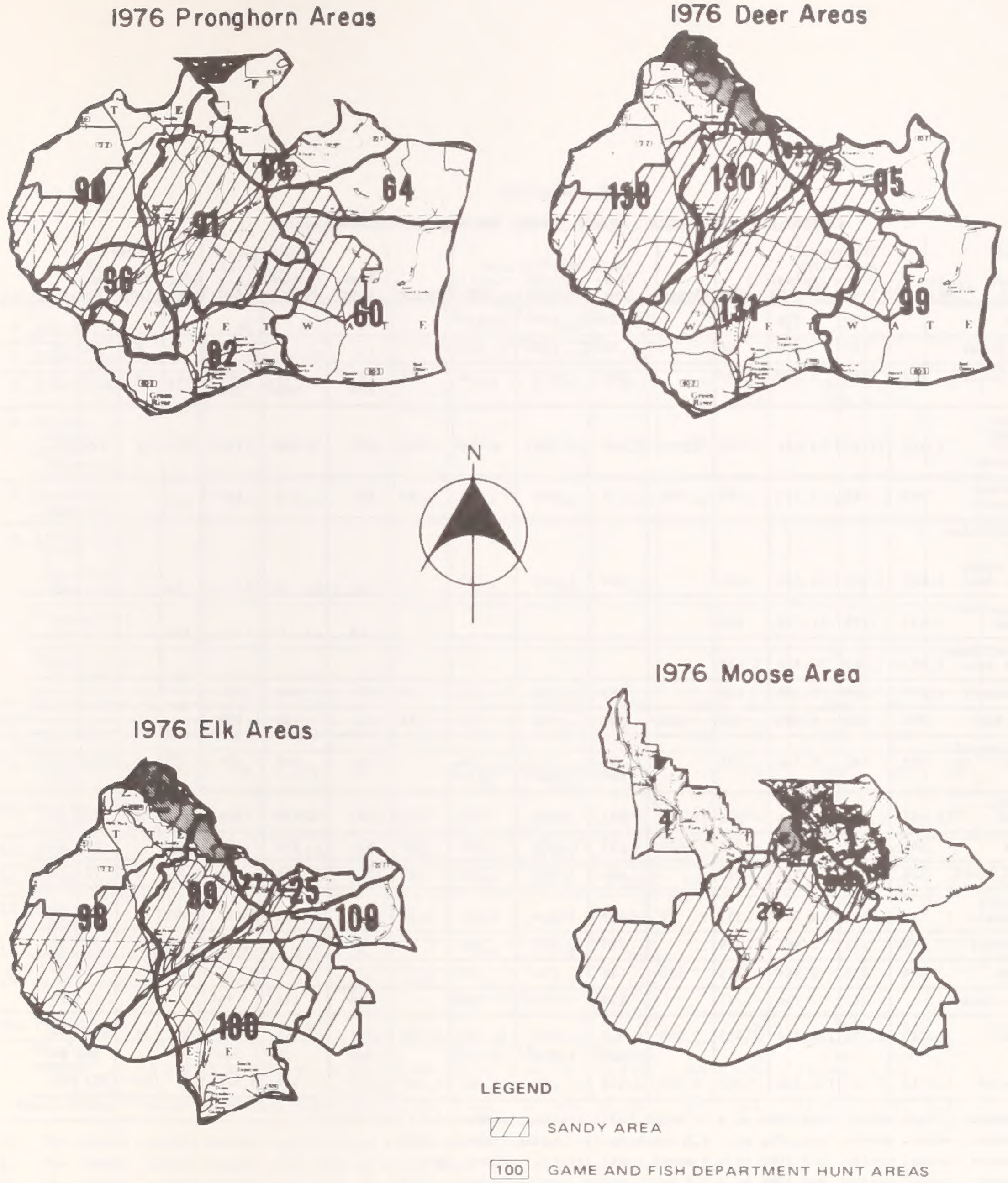
The Sandy area includes 1,256,963 acres of range in good condition for pronghorn; 638,139 acres in fair condition; and 102,228 acres in poor condition (FIGURE 2-28, TABLES 2-28 and 2-29, and MAP 2-11). The overall apparent trend for antelope habitat in the Sandy area is 510,118 acres upward; 1,438,528 static; and 48,681 downward (TABLES 2-31 and 2-32 and MAP 2-17).

Crucial winter habitat covers 214,000 acres (TABLE 2-38). Of this area, 179,329 acres are in good condition for pronghorn; 34,520 is in fair condition; and only 151 acres are in poor condition (TABLE 2-30 and MAPS 2-11 and 2-22). APPENDIX 2J reflects the method used to determine range condition for pronghorn habitat.

The majority of the crucial winter habitat (120,197 acres) is in an apparent static trend and 93,803 acres are apparently upward in trend. There is apparently no downward trend in crucial winter habitat (TABLE 2-33 and MAP 2-17).

Water. The availability and distribution of surface water is important for the maintenance of summer pronghorn populations in the Sandy area. The Little Sandy-Little Prospect Allotment contains a large concentration of summer pronghorn, apparently due to good distribution of water (per. comm., Wyoming Game and Fish Department 1976). Within summer habitat, pronghorn are dependent upon available water sources, including flowing wells, springs, water courses, and stock water troughs. Ecology Consultants (1976a) notes: "It is reasonable to assume that drying up of ephemeral streams and ponds on the Sandy area in mid-summer does exclude some sectors from pronghorn use.... For proper distribution of animals in relation to forage, permanent water sources should not be more than 3-5 miles apart"

Cover. Sagebrush, the most common vegetation species in the Sandy area, provides protective cover during storms and aids in fawn concealment. During extreme winter weather the antelope often migrate for many miles. The highway right-of-way fences have been a source of controversy in Wyoming for many years. These barriers as constructed contribute greatly to the inaccessibility of adequate cover during harsh weather conditions when migrations are occurring. The problems



WYOMING GAME AND FISH DEPARTMENT 1976
Hunt Areas Pertinent to Sandy Area

SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 2 - 21

TABLE 2-36

CURRENT BIG GAME NUMBERS, ANIMAL MONTHS, AND AUMS BY ALLOTMENT

Allotment	Pronghorn Antelope[1] Winter[5]	Pronghorn Antelope[1] Yearlong*	Pronghorn Antelope[1] Animal Months	Pronghorn Antelope[1] AUMs	Mule Deer[1] Winter[6]	Mule Deer[1] Yearlong*	Mule Deer[1] Animal Months	Mule Deer[1] AUMs	Elk[1] Winter[7]	Elk[1] Yearlong*	Elk[1] Animal Months	Elk[1] AUMs	Moose[1] Winter[8]	Moose[1] Yearlong*	Moose[1] Animal Mos	Moose[1] AUMs
1. Bar X		44	528	36		86[2]	559[2]	112[2]								
2. Fish Creek		53	636	44		86[2]	559[2]	112[2]						2	24	24
3. Gold Creek	220	225	2,700	185		306	3,672	734	96	70 67[3]	840 402[3]	560 268[3]	5	6	72	72
4. Little Sandy-Little Prospect	1,344	1,157	13,884	951	2,992	1,980	23,760	4,752	450	468	5,616	3,744	32	28	336	336
5. Steamboat Mountain	397	181	2,172	149	306	45	540	108	60	18	216	144				
6. Little Colorado:																
Big Sandy Use Area	1,622	1,185	14,220	974		104	1,248	250								
Farson Use Area	1,633	979	11,748	805												
Green River Use Area	2,421	1,362	16,344	1,119												
7. Red Desert	1,278	759	9,108	624		263	3,156	631	58	23	276	184				
8. Bush Rim	799	490	5,880	403	301	109	1,308	262	186	40	480	320				
9. Continental Peak	727	395	4,740	325		31 558[2]	372 3,627[2]	74 725[2]		25	300	200	2[4]	*	11[4]	11[4]
10. Pacific Creek	2,284	1,112	13,344	914	1,580	194	2,328	466	361	106	1,272	848	14[4]	*	77[4]	77[4]
11. Sands	871	453	5,436	371	463	117	1,404	281	131	53	636	424			22	22
12. White Acorn	336	276	3,312	227		468	5,616	1,123	129	124	1,488	992	7	6	72	72
13. Prospect Mountain	97	392	4,704	322	76	468	5,616	1,123	34	152	1,824	1,216	1	7	84	84
14. Reservoir	290	214	2,568	176		216	2,592	518					1	3	36	36
15. Poston	394	213	2,568	176	182	18	216	43					3	2	24	24
16. Pine Creek		62	744	51		129[2]	839[2]	168[2]		19[3]	114[3]	76[3]		2	24	24
TOTAL[1]	**14,713**	**9,553**	**114,636**	**7,853**	**5,900**	4,319 859[2]	51,828 5,584[2]	10,366 1,117[2]	1,505	1,079 86[3]	12,948 516[3]	8,632 344[3]	49 16[4]	56	694 88[4]	694 88[4]
GRAND TOTALS[9]	14,713	9,553	114,636	7,853	5,900	5,178	57,412	11,482	1,505	1,165	13,464	8,976	65	56	782	782

1/ The number, animal months, and AUMs on a 12 month basis (spring, summer, fall and winter).

2/ The number, animal months, and AUMs on a 6.5 month basis (spring, summer, fall).

3/ The number, animal months, and AUMs on a 6 month basis (spring, summer, fall).

4/ The number, animal months, and AUMs on a 5.5 month basis (spring, summer, fall).

5/ The winter season is October 20 - May 15 (6.9 mos.).

6/ The winter season is November 1 - May 15 (6.5 mos.).

7/ The winter season is November 15 - May 15 (6 mos.).

8/ The winter season is December 1 - May 15 (5.5 mos.).

9/ The population estimates in this table differ from those used in Chapter 1. The Chapter 1 estimates used to develop the competitive forage reservations were developed on a Sandy area-wide basis and were proportionally divided among the allotments. The figures on this table are density estimates determined on a habitat basis. More accuracy is reflected in this table because it is based on the distribution of animals from more recent data provided by the Game and Fish Department.

* "Yearlong" population is the average population from all seasons for the entire year. Totals from this column were used to determine animal months and AUMs, except for moose where winter populations were used in those allotments where there were no yearlong populations.

TABLE 2-37

DESIRED * BIG GAME NUMBERS, ANIMAL MONTHS, AND AUMs BY ALLOTMENT

Allotment	Pronghorn Antelope 1/ Winter 5/	Pronghorn Antelope Yearlong**	Pronghorn Antelope Animal Months	Pronghorn Antelope AUMs	Mule Deer 1/ Winter 6/	Mule Deer Yearlong**	Mule Deer Animal Months	Mule Deer AUMs	Elk 1/ Winter 7/	Elk Yearlong**	Elk Animal Months	Elk AUMs	Moose 1/ Winter 8/	Moose Yearlong**	Moose Animal Mos.	Moose AUMs
1. Bar X		46	552	37		123 2/	800 2/	160 2/								
2. Fish Creek		55	660	45		123 2/	799 2/	160 2/						3	36	36
3. Gold Creek	227	233	2,796	191		438	5,256	1,051	96	67 3/ 70	402 3/ 840	268 3/ 560	6	8	96	96
4. Little Sandy-Little Prospect	1,389	1,196	14,352	983	4,279	2,831	33,972	6,794	450	468	5,616	3,744	40	35	420	420
5. Steamboat Mountain	410	187	2,244	154	438	64	768	154	60	18	216	144				
6. Little Colorado																
Big Sandy Use Area	1,677	1,225	14,700	1,007		149	1,788	358								
Farson Use Area	1,688	1,012	12,144	832												
Green River Use Area	2,503	1,408	16,896	1,157												
7. Red Desert	1,321	785	9,420	645		376	4,512	902	58	23	276	184				
8. Bush Rim	826	507	6,084	417	430	156	1,872	374	186	40	480	320				
9. Continental Peak	752	408	4,896	335		798 2/ 44	5,187 2/ 528	1,037 2/ 106		25	300	200	3 4/	*	17 4/	17 4/
10. Pacific Creek	2,361	1,150	13,800	945	2,259	277	3,324	665	361	106	1,272	848	18 4/	*	99 4/	99 4/
11. Sands	900	468	5,616	385	662	167	2,004	401	131	53	636	424				
12. White Acorn	348	285	3,420	234		669	8,028	1,606	129	124	1,488	992	9	8	96	96
13. Prospect Mountain	100	405	4,860	333	109	669	8,028	1,605	34	152	1,824	1,216	1	9	108	108
14. Reservoir	300	221	2,652	182		309	3,708	742					1	4	48	48
15. Poston	407	221	2,652	182	260	26 185 2/	312 1,203 2/	62 241 2/					4	3	36	36
16. Pine Creek		64	768	53						19 3/	114 3/	76 3/		3	36	36
TOTAL 1/	15,209	9,876	118,512	8,117	8,437	1,229 2/ 6,175	7,989 2/ 74,100	1,598 2/ 14,820	1,505	86 3/ 1,079	516 3/ 12,948	344 3/ 8,632	21 4/ 61	73	116 4/ 876	116 4/ 876
GRAND TOTAL 9/	15,209	9,876	118,512	8,117	8,437	7,404	82,089	16,418	1,505	1,165	13,464	8,976	82	73	992	992

1/ - The number, animal months, and AUMs on a 12 month basis (spring, summer, fall and winter).

2/ - The number, animal months, and AUMs on a 6.5 month basis (spring, summer, fall).

3/ - The number, animal months, and AUMs on a 6 month basis (spring, summer, fall).

4/ - The number, animal months, and AUMs on a 5.5 month basis (spring, summer, fall).

5/ - The winter season is considered October 20 - May 15 (6.9 mos.).

6/ - The winter season is considered November 1 - May 15 (6.5 mos.).

7/ - The winter season is considered November 15 - May 15 (6 mos.).

8/ - The winter season is considered December 1 - May 15 (5.5 mos.).

9/ - The figures on this table are density estimates determined on a habitat basis. More accuracy is reflected because these estimates are based on the distribution of animals from recent data provided by the Game and Fish Department.

* Desired population levels set in 1976 by the Wyoming Game and Fish Department.

** "Yearlong" population is the average population from all four seasons for the entire year. Totals from this column were used to determine animal months and AUMs, except for moose where winter populations were used.

TABLE 2-38

PRONGHORN CRUCIAL WINTER HABITAT BY PASTURE

Allotments	Pasure	Habitat Acres and Percent of Pasture	
Little Sandy-Little Prospect	2	23,552	(41)
	3	5,888	(10)
Little Colorado			
Farson Use Area	2	3,266	(5)
	3	21,854	(26)
Big Sandy Use Area	2	73,360	(94)
Pacific Creek	3	39,040	(57)
Sands	1	19,859	(51)
	2	1,712	(5)
	3	12,669	(33)
Reservoir	2	6,656	(50)
	3	6,144	(55)
TOTAL	11	214,000	

TABLE 2-39

VEGETATION TYPES FREQUENTLY USED BY SELECTED WILDLIFE SPECIES

Vegetation Type	Acres*	Pronghorn Antelope	Mule Deer	Elk	Moose	Sage Grouse
Sagebrush-Grass	1,531,475	X+	X	X	X	X+
Saltbush-Winterfat	190,463	X				
Greasewood	100,740	X				
Meadow	48,221	X	X	X	X	X
Grass	38,820	X	X	X		X
Perennial Forb	30,635	X				
Mountain Shrub	29,654		X+	X+	X	
Conifer	20,887		X	X	X	
Barren	4,400					
Waste	2,035					
TOTAL	1,997,330*					

X - Vegetation types used by indicated animal.
+ - Indicates the most frequently used.
* - Allotment and custodial pasture totals. Cattle and/or sheep occur on all of these vegetation types. Includes NRL, State, and private lands in custodial pastures and allotments. Does not include 1,590 acres of U. S. Fish and Wildlife Service lands, 160 acres of U. S. Forest Service lands, and the 970-acre Palmer Draw no grazing area.

TABLE 2-40

PERCENT OF PLANTS IN DIET OF PRONGHORN BY SEASON

	Grass*	Forbs	Shrubs
Spring	17	35	48
Summer	2	27	71
Fall	3	9	88
Winter	4	1	95

* Including grass-like plants.
Source: Colorado State University Red Desert Fecal Analysis.

TABLE 2-41

FECAL ANALYSIS COMPETITION LEVELS FOR PRONGHORN
Percent Overlap of Diet with Pronghorn

	Cattle				Sheep				Horses			
Season	Sp	Su	Fa	Wi	Sp	Su	Fa	Wi	Sp	Su	Fa	Wi
Spring	3	2	4	3	8	5	4	6	2	2	3	1
Summer	3	6	7	4	10	12	5	18	3	4	3	5
Fall	13	5	21	12	24	7	21	8	3	3	10	3
Winter	3	2	3	3	6	4	2	6	1	0	2	0

Sp - Spring; Su - Summer; Fa - Fall; Wi - Winter
Source: Colorado State University Red Desert Fecal Analysis.

FIGURE 2-28 PRONGHORN SUMMER AND CRUCIAL WINTER HABITAT. This photo of the Little Colorado Allotment is typical of the habitat condition in August prior to the livestock use in the fall.

associated with pronghorn antelope and restrictive sheep-tight fences are well documented (Oakley and Riddle 1972 and 1973, Julian 1973).

According to the Wyoming Game and Fish Department (per. comm., 1975), the existing low amount of fencing in the Sandy area has allowed relatively unrestricted passage by pronghorn to and from seasonal use areas. Notable exceptions as discussed above include sheep-tight highway right-of-way fences and existing fences within the Eden Irrigation Project.

Migration. As shown on MAP 2-22, antelope migrations are common in the Sandy area, primarily during the spring and late fall. The antelope winter in the Farson-Eden farming area and migrate from this area to the various ranges in their summer habitat. Spring movements from the Farson-Eden area extend eastward and north into the heart of the Little Colorado Allotment and out of the north end of the wintering area into the allotments east of Highway 187 and north of Highway 28.

The fences around the farming area are constructed by various standards and present some problems for migrating antelope. The biggest problem occurs east and west of the fenced part of Highway 187. Antelope moving north from the checkerboard during the spring and back in the fall have problems negotiating this fenced right-of-way. Lay-down panels have been constructed to facilitate antelope movement to and from summer habitat. This fencing alteration has not been successful, primarily because the panels have not been laid down and left down at the proper time.

The north side of Highway 28 has a four-strand wire fence which restricts north and south movement of migrating antelope herds and hinders their escape from vehicles on the highway.

The Red Desert antelope herds, including pronghorn in the Continental Peak, Bush Rim, and Red Desert Allotments, are not restricted in their north and south movements. The area's northern boundary has been fenced in excess of ten years and antelope negotiate this with only occasional problems (Wyoming Game and Fish Department, September 1976).

Mule Deer. The north central portion of the Sandy area is important deer winter habitat (TABLE 2-42). From here the deer migrate into the Wind River Mountains in the summer (Ecology Consultants 1976a). Another deer winter habitat is located near Essex Mountain in the south central section (MAP 2-23 located at the end of this chapter and Ecology Consultants 1976a). In addition to the wintering population, there is yearlong use by deer in each of the allotments (TABLE 2-36).

The population levels are managed by the Wyoming Game and Fish Department. Estimated numbers (TABLE 2-36) are based on data provided by the Department. Since they do not collect population data tied to the Sandy area, interpretation by BLM wildlife biologists is necessary to estimate population levels in the Sandy area.

The Wyoming Game and Fish Department allows deer hunting each year in the fall to manage population levels. Hunt areas which include portions of the Sandy area are shown on MAP 2-21. Average hunt harvest information is given in the recreation section.

Food. Mule deer concentrations are greatest in the areas with mountain shrub and sagebrush-grass vegetation types (TABLE 2-39 and FIGURE 2-29). The shrubs found in these vegetation types produce key forage for the deer, especially big sagebrush and antelope bitterbrush. Studies are not available on the actual diet of the deer in the Sandy area. Other studies on mule deer, however, indicate that the winter diet consists of 74% shrubs and trees, 15% forbs, and 11% grasses (Ecology Consultants 1976a).

Additional browse species having local importance to deer include other sagebrush species, rabbitbrush, rose, skunkbush, sumac, serviceberry, and juniper. The use of grasses and forbs increases during the spring and summer months (TABLE 2-43, Compton 1974, Goodwin 1973, Mackie 1970, and Martinka 1968).

One of the most critical habitat elements is the amount and quality of browse available during winter months. The size of deer herds in the Sandy area is presently limited by the browse factor. Herd productivity during the spring and summer is dependent upon the availability of suitable grasses, forbs, and shrubs for pregnant/lactating does (Ecology Consultants 1976a).

Competition for forage is believed to exist between livestock and deer where they utilize the same areas. The diets of sheep and cattle in the Sandy area have an average overlap with deer of 14% for sheep and 15% for cattle (per. comm., CSU 1975).

The Sandy area includes 704,724 acres of range in good condition for deer, 314,355 acres in fair condition, and 61,640 in poor condition (TABLES 2-28 and 2-29). Marginal use (see Glossary) areas for deer total 916,611 acres (TABLE 2-28). The overall apparent range trend for deer habitat in the Sandy area is 440,997 acres upward; 622,392 static; and 19,733 downward (TABLES 2-31 and 2-32).

There are 249,984 acres of crucial winter habitat for deer in the Sandy area (TABLE 2-33 and MAPS 2-11 and 2-23). Most of the crucial winter habitat, 147,278 acres, is in good range condition for deer, 90,418 acres are in fair condition, and 12,288 acres are in poor condition (TABLE 2-30). APPENDIX 2J reflects the methods used to determine range condition for mule deer. The apparent trend of the mule deer crucial winter habitat is upward with 246,195 acres (98%) in upward or static condition (TABLE 2-33).

Water. According to Ecology Consultants (1976a), "Proximity to water is not a factor in winter, since moisture requirements are met by snow" In summer deer are usually found in higher elevations where water is not considered to be a problem.

Cover. Cover is not considered a limiting factor except during adverse weather conditions. Deer tend to move to south and east slopes where temperatures are less extreme and food is more plentiful (Ecology Consultants 1976a). Higher population densities of mule deer tend to occur in moderately timbered areas, broken or rolling terrain, and along drainage courses where cover is available.

TABLE 2-42

MULE DEER HABITAT BY PASTURE

Allotment		Pasture	Crucial Winter Habitat Acres 1/2/	Crucial Winter Habitat %	Yearlong Habitat Acres 1/2/	Yearlong Habitat %
			Habitat Acres and Percent of Pasture*			
Bar X		1			2,124	100
		2			2,543	100
		3			2,228	100
	Total				6,895	100[2]
Fish Creek		1			3,389	100
		2			3,848	100
	Total				7,237	100
Gold Creek		1			4,662	100
		2			10,591	100
		3			9,327	100
		4			5,945	100
	Total				30,525	100
Little Sandy-Little Prospect		1	29,536	71	41,759	100
		2	40,576	71	57,305	100
		3	40,293	71	56,968	100
		4	3,775	23	16,086	100
		5	5,756	43	13,542	100
	Total		119,936	65	185,660	100
Steamboat Mountain		1	11,991	51	23,497	100
		2	4,751	28	17,040	100
	Total		16,742	41	40,537	100
Little Colorado						
Green River Use Area		1			35,736	35
		2			117,176	100
		3			12,677	15
	Subtotal				165,589	55
Big Sandy Use Area		1			13,640	20
		2			25,670	33
		3			21,616	30
	Subtotal	3			60,926	28
	Total				226,515[3]	31
Red Desert	Total	2			3,949[3]	5
Bush Rim		1	0		12,937	35
		2	1,536	4	35,050	100
		3	0		3,253	10
	Total		1,536	1	51,240[3]	49
Continental Peak		1			9,265	30
		2			15,514	55
		3			24,979	85
	Total				49,758[3]	56
Pacific Creek		1	33,459	47	71,747	100
		2	0		62,652	100
		3	0		68,457	100
	Total		33,459	16	202,856	100
Sands		1	0		38,694	100
		2	20,817	55	37,986	100
		3	3,785	10	38,172	100
	Total		24,602	21	114,852	100
White Acorn		1			12,741	100
		2			8,048	100
		3			8,153	100
		4			7,622	100
		5			10,230	100
	Total				46,794	100
Prospect Mountain		1	4,746	47	10,128	100
		2	18,532	100	18,532	100
		3	13,994	95	14,730	100
		4	5,387	40	13,402	100
		5	1,501	15	9,959	100
	Total		44,160	66	66,751	100
Reservoir		1			10,932	100
		2			13,437	100
		3			11,176	100
	Total				35,545	100
Poston		1	227	1	13,486	80
		2	0	0	10,403	55
		3	9,322	62	14,864	100
	Total		9,549	19	38,753[3]	77
Pine Creek		1			5,689	100
		2			4,588	100
		3			3,812	100
	Total				14,089	100
	Grand Total		249,984	13	1,121,956	57

* Acreages of crucial winter and yearlong overlap in all allotments and those for yearlong encompass crucial winter habitat

1/ Excludes custodial pastures, no grazing, and withdrawals.

2/ Acres shown reflect only the most significant habitat. Allotments with predominance of marginal use and a low percentage of good and fair habitat condition (TABLE 2-28) are not considered significant.

FIGURE 2-29 DEER AND ELK CRUCIAL WINTER HABITAT. This photo is typical sagebrush-grass vegetation type in the Little Sandy-Little Prospect Allotment which serves as mule deer and elk winter habitat as well as sage grouse habitat.

TABLE 2-43

PERCENT OF PLANTS IN DIET OF MULE DEER BY SEASON

	Grass*	Forbs	Shrubs
Spring	13	35	52
Summer	1	56	43
Fall	6	24	70
Winter	2	10	87

* Including grass-like plants.

Sources: Table 16 of BLM Manual 6601-6 and Mackie 1970.

Deer movements in the area are relatively unrestricted. Some loss as a result of fencing occurs, but it seems to be minimal due to existing fence design, location, and nature of deer to jump fences.

Elk. The largest numbers of elk, typically 1,500, use the Sandy area in the winter. A smaller number of elk use the Sandy area for the entire year for an average population of 1,165 (TABLE 2-36).

The Wyoming Game and Fish gathers elk population data on State herd unit areas (MAP 2-21). Estimated populations for the Sandy area are based on that information as interpreted by BLM wildlife biologists (TABLE 2-36).

The winter use areas are considered crucial to the maintenance and continued well-being of elk herds on the Sandy area (Ecology Consultants 1976a and MAP 2-24, located at the end of this chapter).

The primary crucial winter habitat in the Sandy area is located in the Little Sandy-Little Prospect Allotment. The lower wintering area located around Steamboat Mountain is larger, but it does not contain as many animals.

The main summer use concentration in the Sandy area is located along the Wind River Front and the Pacific Creek and Steamboat Mountain Allotments (TABLES 2-44 and 2-45). Many of the elk which winter in the Sandy area migrate to the Wind River Mountains around the first of May as the snow melts and forage becomes available. They leave the summer habitat when heavy snows begin, usually in November.

Elk usually calve in Wyoming in late May or early June (Ecology Consultants 1976a). By this time they are generally on the summer habitat. Known calving grounds are located in the Gold Creek and Pacific Creek Allotments.

Each year the Wyoming Game and Fish Department allows hunting on the hunt management areas which include portions of the Sandy area (MAP 2-21) to manage population levels. Average hunt harvest information is given in the recreation section.

Food. Elk consume an estimated 8,976 AUMs of forage per year in the area (TABLE 2-36). Grasses and shrubs constitute the major portion of the elk's diet (TABLE 2-46). Forbs are used mainly in the spring and summer, but they provide little forage in the fall and winter. Shrubs compose a major portion of the diet during the summer for the Steamboat Mountain elk, but elk use of shrubs tapers off during the winter.

"When snow cover prevents the animals from uncovering herbaceous foods, browse becomes an increasingly important component of the diet"(Ecology Consultants 1976a). Fecal analysis surveys were conducted on the elk, pronghorn, wild horses, cattle, and sheep in the Red Desert. The data from the study support a high degree of competition between elk and cattle, horses, and sheep (TABLE 2-47).

The elk in the Sandy area primarily utilize the conifer, mountain shrub, and sagebrush-grass vegetation types for food (TABLE 2-39). They also use meadow types to great extent (Ecology Consultants 1976a).

The Sandy area includes 249,070 acres of range in good condition for elk, 187,983 in fair condition, and 45,258 in poor condition (TABLES 2-28 and 2-29 and FIGURE 2-30). Marginal use (see Glossary) areas for elk total 1,515,019 acres (TABLE 2-28 and 2-29). The apparent overall trend for elk habitat is 167,155 acres upward, 305,462 static, and 8,802 downward (TABLES 2-31 and 2-32).

Of the total of 226,505 acres of elk crucial winter habitat, 115,176 acres are in good condition; 93,898 in fair condition; and 17,431 in poor condition (TABLE 2-30). The apparent trend for elk crucial winter habitat in the area is 72,934 acres in upward trend; 146,249 in static trend; and 7,322 acres in declining condition (TABLE 2-33). APPENDIX 2J reflects the methods used to develop range condition for elk habitat.

Water. Water availability in the Sandy area is not believed to be a critical factor for elk as snow consumption fulfills the needs for the wintering elk and adequate water is spread throughout the summer areas (Ecology Consultants 1976a).

Cover. According to Ecology Consultants (1976a), "Except for periods of extreme weather, the cover requirement for wintering elk appears to be minimal. Swells, drainages, and the lee side of ridges provide some protection from winds during stress periods" Few barriers exist on the Sandy area today which would limit access to cover, food, and water. A total of 24 miles of fence exists on the crucial winter habitat.

Migration. Two major elk migrations occur. The Desert Herd summers around Steamboat Mountain, Oregon Buttes, and Continental Peak, then moves south and westward into the sand dunes of the Sands and Pacific Creek Allotments and the checkerboard area south of the Sandy area (MAP 2-24). The other major movement occurs when elk herds that winter in the Prospect Mountain country of the Little Sandy-Little Prospect, Prospect Mountain, and White Acorn Allotments migrate northward to the Wind River Front country adjacent to and in the Bridger-Teton Forest. Fences in the latter area are more plentiful than anywhere else in the Sandy area but apparently create little or no barrier to these elk movements.

Moose. The moose is the largest of the big game animals in the Sandy area, but has the smallest population. The population appears to have stabilized during the last five years (Ecology Consultants 1976a). Although the use increases during the winter periods, a relatively large number are yearlong residents. Estimated population levels are shown on TABLE 2-36.

The moose habitat in the Sandy area generally is related to the wetter sites along the perennial streams. During the summer many of the moose are located in the Wind River Front area, and in the winter they drop down to the lower reaches of the streams in the Sandy area (MAP 2-25, located at the end of this chapter).

Winter is believed to be the most crucial time for the moose as it is the period of greatest stress. Winter habitat (TABLE 2-48) appears to be directly tied to willow growth. Willows at times are browsed to a height of ten feet (Ecology Consultants 1976a).

TABLE 2-44

ELK HABITAT BY PASTURE

Allotment	Pasture		Crucial Winter Habitat Acres1/	Crucial Winter Habitat %	Summer Habitat Acres1/	Summer Habitat %
			Habitat Acres and Percent of Pasture2/			
Gold Creek	1		3,040	65	3,040	65
	2		0	0	10,591	100
	3		877	9	466	5
	4		0	0	5,886	99
		Total	3,917	13	19,983	65
Little Sandy - Little Prospect	1		18,966	45	0	0
	2		13,060	23	0	0
	3		12,947	23	0	0
	4		4,565	28	3,217	20
	5		1,534	11	677	5
		Total	51,072	28	3,894	2
Steamboat Mountain	1		8,291	35	23,497	100
	2		13,495	79	17,040	100
		Total	21,786	54	40,537	100
Little Colorado Big Sandy Use Area	3	Total	0	0	21,616	30
Red Desert	2	Total	38,088	48	11,848	15
Bush Rim	1		12,257	33	16,634	45
	2		35,050	100	34,700	99
	3		3,253	10	1,627	5
		Total	50,560	48	52,961	51
Pacific Creek	1		29,295	41	68,160	95
	2		7,671	12	12,530	20
	3		0	0	27,383	40
		Total	36,966	18	108,073	53
Sands	1		0	0	36,759	95
	2		11,520	30	37,986	100
	3		0	0	38,172	100
		Total	11,520	10	112,917	98
White Acorn	1		756	6	0	0
	2		472	6	0	0
	3		945	12	0	0
	4		0	0	2,287	30
	5		1,181	12	0	0
		Total	3,354	7	2,287	5
Prospect Mountain	3		8,026	54	0	0
	4		0	0	7,371	55
	5		1,216	12	498	5
		Total	9,242	14	7,869	12
Pine Creek	1	Total	0	0	284	5
	Grand	Total	226,505	12	382,269	19

1/Excludes custodial pastures, no grazing, and withdrawals; acres are for pastures, except as noted.

2/Acres shown reflect only the most significant habitat. Allotments with predominance of marginal use and a low percentage of good and fair habitat condition (TABLE 2-28) are not considered significant.

TABLE 2-45

CUSTODIAL PASTURES PROVIDING ELK HABITAT

Allotment	Pastures with Winter Habitat	Acres of NRL	Pastures with Summer Habitat	Acres of NRL
Gold Creek			C-9	96
			C-10	71
Steamboat Mountain			C-3	144
			C-4	54
Little Sandy-	C-17	197	C-21	1,094
Little Prospect	C-18	120		
	C-19	191		
	C-20	3		
Sands			C-1	170
			C-2	77
White Acorn			C-12	66
			C-13	13
Prospect Mountain	C-25	2,153	C-26	1,677
			C-27	98
			C-29	13
			C-30	1,083
TOTALS	5	2,664	13	4,656

TABLE 2-46

PERCENT OF PLANTS IN DIET OF ELK BY SEASON

	Grass*	Forbs	Shrubs
Spring	65	22	13
Summer	54	15	31
Fall	74	3	23
Winter	94	2	4

*Includes grass-like plants.
Source: Colorado State University Red Desert Fecal Analysis.

TABLE 2-47

PERCENT OF ELK COMPETITION WITH OTHER ANIMALS

	Percent Overlap of Diet With Elk											
	Cattle				Sheep				Horses			
Season	Sp	Su	Fa	Wi	Sp	Su	Fa	Wi	Sp	Su	Fa	Wi
Spring	89	54	54	77	27	25	28	49	26	71	64	31
Summer	14	16	11	9	7	18	8	14	14	14	7	14
Fall	71	49	53	70	17	21	24	40	16	74	68	22

Sp - Spring; Su - Summer; Fa - Fall; Wi - Winter
Source: Colorado State University Red Desert Fecal Analysis.

FIGURE 2-30 ELK, MOOSE AND MULE DEER CRUCIAL SUMMER HABITAT. This photo taken in the White Acorn Allotment shows typical crucial summer habitat used by big game. This site is in good condition and has an upward trend for all species of big game.

TABLE 2-48

MOOSE CRUCIAL HABITAT BY PASTURE

Allotment	Pasture	Crucial Winter Habitat[1] Acres	Crucial Winter Habitat[1] %	Summer Habitat[1] Acres	Summer Habitat[1] %
Bar X	1	1,873	88	1,487	70
	2	1,471	58	1,399	55
	3	803	38	334	15
Total		4,147	60	3,220	47
Fish Creek	1	2,404	71	3,050	90
	2	1,078	28	2,501	65
Total		3,482	48	5,551	77
Gold Creek	1	2,759	59	0	
	2	726	7	10,590	100
	3	2,760	30	4,664	50
	4	437	7	1,486	25
Total		6,682	22	16,740	55
Little Sandy-Little Prospect	1	2,915	7	10,440	25
	2	16,761	29	5,731	10
	3	20,695	36	0	0
	4	0	0	7,239	45
	5	0	0	2,708	20
Total		40,371	22	26,118	14
Little Colorado Green River Use Area	1	3,501	3	2,042	2
	2	2,001	2	1,172	1
	3	7,170	8	4,226	5
Total		12,672	4	7,440	2
Continental Peak	2	307	1	307	2
Total		307	1	307	2
Pacific Creek	2	8,476	14	0	0
	3	4,574	7	0	0
Total		13,050	6	0	0
White Acorn	1	6,800	53	0	0
	2	6,237	77	0	0
	3	8,153	100	2,038	25
	4	0	0	7,241	95
	5	2,900	28	7,673	75
Total		24,090	51	16,952	36
Prospect Mountain	1	1,631	16	5,064	50
	2	7,599	41	10,193	55
	3	3,800	26	3,683	25
	4	0	0	13,402	100
	5	0	0	9,959	100
Total		13,030	20	42,301	63
Reservoir	1	4,300	39	2,186	20
	2	305	2	672	5
Total		4,605	13	2,858	8
Poston	1	1,285	8	1,686	10
	2	321	2	0	0
	3	4,818	32	2,973	20
Total		6,424	13	4,659	9
Pine Creek	1	1,024	18	1,442	25
	2	366	8	229	5
	3	1,682	44	1,906	50
Total		3,072	22	3,557	25
Grand Total		131,932	7[2]	129,703	7[2]

Habitat Acres and Percent of Pasture

[1]Excludes custodial pastures, no grazing, and withdrawals.

[2]Expressed as percentage of the Sandy area.

Each year the Wyoming Game and Fish Department provides a limited hunting season on moose to manage population levels. Average hunt harvest information is given in the recreation section for hunt areas which include portions of the Sandy area (MAP 2-21).

Food. The actual diet of the moose in the Sandy area has not been studied; however, based on studies by Ecology Consultants (1976a) and a literature search, generalizations can be made (Wilson 1971, Houston 1968, Dorn 1970, Krefting 1974, Martin et al. 1951). Willows appear to be the most predominant and desired browse species, probably running as high as 86% of the annual diet (TABLE 2-49). Other wet meadow forage also adds to the diet. Dietary overlap between moose and cattle is approximately 9%. However, cattle often trample, break, and eat young willows along the streams.

The Sandy area includes 104,016 acres of range in good condition for moose; 121,976 in fair condition; and 21,242 in poor condition. Marginal use areas total 1,750,096 acres (TABLES 2-28 and 2-29). The overall apparent trend for moose habitat in the Sandy area is 63,313 acres upward; 175,872 static; and 12,613 downward (TABLES 2-31 and 2-32).

The range condition for the crucial winter habitat (131,932 acres) is in similar condition as only 6% (8,575 acres) is in poor condition (TABLE 2-30, FIGURE 2-31, and MAP 2-14). APPENDIX 2J reflects the methods used to determine range condition for moose habitat. The apparent trend for moose crucial winter habitat in the area is 28,312 acres in upward trend; 99,621 in static trend; and 3,999 in downward trend (TABLE 2-33 and MAP 2-20).

Migration. It is likely that moose in the Sandy area move seasonally from winter use of willow-dominated meadow types along the rivers to spring and summer habitat on the higher slopes of the northern portion of the Sandy area and beyond. Most seasonal movements are related to snow cover (Ecology Consultants 1976a).

Sage Grouse. The sage grouse is the predominant and most important game bird inhabiting the Sandy area. The actual number of sage grouse is not known; however, populations are abundant and believed to be expanding (Ecology Consultants 1976a).

The entire Sandy area is generally considered summer habitat for sage grouse with population concentrations around water sources. The grouse have a close association with sagebrush and live predominantly in the sagebrush-grass type. In the winter they congregate in smaller use areas (TABLE 2-50 and MAP 2-26 which is located at the end of this chapter).

Important areas for sage grouse are the strutting grounds, brood-rearing areas, and winter habitat (Ecology Consultants 1976a). Strutting areas are typically open, flat, and surrounded by low sagebrush. It is these areas where courtship occurs. Known breeding complexes, the area adjacent to and including the strutting grounds (see Glossary), are shown on MAP 2-26. Brood-rearing areas are critical to these young birds as reproductive success is believed to be tied to vegetal conditions (FIGURE 2-32). Winter areas must contain sagebrush high enough to be above the snow but low enough for easy access by the birds (Ecology Consultants 1976a).

Food. Seasonal feeding patterns are evidenced in many studies that apply to sage grouse population in the Sandy area. These studies show almost total dependence on sagebrush through fall, winter, and early spring of each year. As forbs become increasingly available during spring, the grouse increase use of them. During early fall they shift back to a diet of sagebrush as forbs are no longer available (Ecology Consultants 1976a).

Juvenile sage grouse rely more heavily on insects for food during the summer months than adults, especially for the first weeks after hatching. They gradually shift from insects to forbs within the first month. After three months sagebrush becomes the major part of their diet (Ecology Consultants 1976a).

Riparian areas supply an abundance of both insects and forbs for the young grouse. Therefore these areas are heavily used by grouse in the spring and summer months. In the Little Colorado Allotment, sage grouse are often found near wells. These wells do not generally furnish riparian habitat.

The studies conducted by Ecology Consultants found the mean utilization of sagebrush on the sage grouse winter habitat to be 74.5%.

Water. Ecology Consultants (1976a) notes: "Controversy among researchers exists over the need for free water in sage grouse habitats.... Most likely, sage grouse can obtain most of their water needs from succulent vegetation and dew during wet years, but, undoubtedly, free water as occurs in several places on the Sandy area is essential during years of less than average precipitation" It is reasonable to expect that the populations are limited to some degree by the lack of free water and meadow growth in the Sandy area.

Cover. Studies conducted in Montana found the highest wintering population in brush stands with a cover of 20%. Ecology Consultants (1976a) found the average cover in breeding complexes to be 20.3%; in winter habitat the average was 16.2%.

Waterfowl. Waterfowl populations in the Sandy area are not known, but TABLE 2-51 shows yearly estimates of numbers that use two breeding grounds in the Sandy area. The Sandy area is considered a part of the Pacific Flyway. The majority of the area provides only occasional spring nesting habitat because of long-term freezing of the waterways and ponds each year. Many of the open waters are used by waterfowl during molting in the summer. Most of the ponds and streams are used in the fall by waterfowl for resting.

The best waterfowl habitat is located along the flowing waters such as Pacific and Jack Morrow Creeks, the Little Sandy, Big Sandy, Sweetwater, and Green Rivers (MAP 2-27, located at the end of this chapter). The Green River, especially below the Fontenelle Reservoir, offers prime nesting habitat for waterfowl.

Commonly observed puddle ducks include the mallard, pintail, shoveler, American widgeon, gadwall, and teal. Diving ducks include the ring-necked duck and redhead. The most common goose observed in the Sandy area is the Canada goose.

TABLE 2-49

PERCENT OF PLANTS IN DIET OF ELK BY SEASON

	Grass*	Forbs	Shrubs
Spring	65	22	13
Summer	54	15	31
Fall	74	3	23
Winter	94	2	4

* Includes grass-like plants.

Source: Houston 1968.

FIGURE 2-31 MOOSE CRUCIAL WINTER HABITAT. This photo shows moose crucial habitat in the Prospect Mountain Allotment. It is in poor condition and has a downward apparent trend. FIGURE 2-30 reflects moose crucial habitat in the more typical good condition.

TABLE 2-50

ACRES OF SAGE GROUSE WINTER HABITAT BY ALLOTMENT*

Allotment	Acres
Little Sandy-Little Prospect	136,320
Steamboat Mountain	1,280
Little Colorado	423,080
Red Desert	186,083
Bush Rim	23,040
Pacific Creek	158,545
Sands	97,934
White Acorn	3,840
Prospect Mountain	39,940
Reservoir	36,151
Poston	52,877
TOTAL	1,159,090

*Only those allotments with winter habitat are listed.

FIGURE 2-32 TYPICAL SAGE GROUSE BROOD REARING AREA. This photo shows a typical meadow in the proposed Little Sandy-Little Prospect Allotment which is used by sage grouse for brood rearing as well as winter habitat.

TABLE 2-51

AVERAGE DUCK POPULATIONS IN SWEETWATER COUNTY BREEDING GROUNDS*

(Five-Year Average for 1972-1976)

BIG ISLAND SURVEY AREA (58 SQUARE MILES)

Species	Pairs	Grouped Ducks
Mallard	96	6
Teal	13	17
Gadwall	14	9
Shoveller	4	-
Merganser	26	18
Pintail	9	-
Lesser scaup	trace	-
American Widgeon	2	-
Goldeneye	trace	-
Redhead	1	-
Bufflehead	trace	-
Ruddy	trace	-
Unknown ducks	6	59
Coot	-	32
	171**	141**

FARSON SURVEY AREA (11 SQUARE MILES)

Species	Pairs	Grouped Ducks
Mallard	29	2
Teal	8	3
Pintail	8	-
Shoveller	3	2
American Widgeon	4	-
Gadwall	5	-
Lesser scaup	3	-
Bufflehead	trace	-
Redhead	trace	-
Merganser	trace	-
Unknown ducks	4	20
Coot	-	2
	64**	29**

* Data not corrected for aerial visibility bias.

** The total number of ducks, determined by multiplying pairs by two and adding the grouped duck category, is estimated at 483 for Big Island and 157 for Farson.

About 1,500 acres of the Seedskadee National Wildlife Refuge are within the Sandy area. The refuge was established when riparian habitat was lost to flooding that followed the construction of Fontenelle Dam. The refuge is being developed primarily for duck production and rest areas during fall and spring migrations.

Food. Primary foods for ducks in the Sandy area probably include pond weed, sedges, rushes, and waterlily. Animal food is estimated to be less than 15% of the diet (Martin, et al. 1951).

Cover. Puddle ducks nest on dry land where sufficient vegetation exists to provide cover requirements. Most nests are within 100 yards of water. Diving duck nesting habitat occurs along shorelines or among emergent vegetation in areas of large or deeper water bodies such as the Big Sandy and Farson-Eden Reservoirs. Goose nesting and brood rearing also occur in similar habitats used by diving ducks. Many of the potential cover areas around flowing wells and small reservoirs have limited nesting due to the absence of vegetal cover.

Water. Waterfowl are closely tied to waters wherever they exist. The flowing waters found in the streams provide water longer during the year as flowing waters are slower to freeze and thaw out quicker.

Nongame Species

Numerous species of nongame birds, mammals, reptiles, amphibians, and invertebrates use the Sandy area; many are yearlong residents. Nongame species are found in all vegetation types described in the vegetation section. More specific crucial habitat requirements and diet similarities among representative wildlife species in the Sandy area are reflected in TABLE 2-34. A more detailed treatise, listing foods for species on a regional basis, including some seasonal food habit needs considered applicable to nongame species in the Sandy, is located for reference in the Rock Springs District Office (*American Wildlife and Plants Guide to Wildlife Food* Habits, Martin, Zim, and Nelson 1951). Because of the Sandy's great diversity of both nongame species and their food habits, it is determined best not to include all of this information, since it would be inappropriately lengthy.

Ecology Consultants Inc. (1976b) prepared narratives on selected wildlife species in the Sandy area. Included categories as defined by the Wyoming Game and Fish Department, are: "protected birds"and "predatory animals" The Ecological Consultants' narratives did not identify any particular nesting habitat needs or changes needed in the current livestock program related to nongame species. These narratives are available for review in the Rock Springs District Office.

In addition to the studies on selected animals mentioned about, the Chihuahuan Desert Research Institute provided a raptor and prairie dog survey of the Sandy area in 1976. This study is available for review in the Rock Springs District Office. For each raptor species occurring in the Sandy area, a life history, narrative on sightings, location of nests, and an evaluation of species status was provided.

Typical areas used by the raptors were those with trees, including the meadow, mountain shrub, and conifer vegetation types. The most common of the raptors appears to be the golden eagle, which was seen almost every day of the survey (Chihuahuan Desert Research Institute 1976). The bald eagles appear to be the northern subspecies which is included in the Federal Endangered Species list *(Federal Register* 14 February 1978, Vol. 43, No. 31). Other raptors investigated were: (1) sharp-shinned hawk, (2) Cooper's hawk and goshawk, (3) red-tailed hawk, (4) Swainson's hawk, (5) roughlegged hawk, (6) ferruginous hawk, (7) harrier, (8) osprey, (9) prairie falcon, (10) peregrine falcon, (11) kestrel, (12) great horned owl, and (13) burrowing owl.

Critical and important use areas for the birds were identified in general and included: (1) tall cliffs; (2) cliffs along the Big Sandy and Little Sandy Rivers; (3) juniper or limber pine hillsides; (4) riparian cottonwood groves; (5) riverbanks, islands, and flood plains; (6) areas where prairie dogs are concentrated; (7) Douglas fir and pine forests; and (8) aspen groves.

Some of the birds are apparently very sensitive to human activities. According to Chihuahuan Desert Research Institute (1976), "A single human visit to the vicinity of the nest of many species may cause desertion of the nest site, particularly when done early in the nesting cycle"

Threatened and Endangered Species

Those wildlife species determined by the Secretary of the Interior to be threatened with extinction are on the "endangered species"list published in the *Federal Register.* Some species, while not endangered throughout their range, have remnant populations in danger of being eliminated in local areas. This has prompted the Wyoming Game and Fish Department to develop a "rare and endangered"species list. Both State and Federal lists include only the peregrine falcon and black-footed ferret as endangered species within the Sandy area (Wyoming Game and Fish Department undated, U.S. Fish and Wildlife Service 1974). Formal consultation under Section 7 of the Endangered Species Act of 1973 has been initiated with the U.S. Fish and Wildlife Service.

Black-Footed Ferret. The number of black-footed ferrets in the Sandy area is unknown. There have been six reports of ferret sightings from 1851 to 1975 within the boundary of the Sandy area (Clark 1975). These were in the Little Colorado, Little Sandy-Little Prospect, Red Desert, and Pacific Creek Allotments. Nearly all of the ferrets sighted in Wyoming were reportedly seen in a sagebrush-grass vegetation type. Two sightings were in a conifer type, and one sighting was in a meadow (Clark 1975).

The Sandy area falls within a "positive"zone for ferret activity, which means the habitat is characterized by abundant ground dwelling "sciurids,"especially prairie dogs (Chihuahuan Desert Research Institute 1976). The region has a documented history of ferret reports and physical evidence of activity has been documented (Clark 1975).

Areas with high potential for ferret activity are located north of Farson, along parts of White Mountain, around Pine Canyon, and in the Buffalo Hump-Red Desert area because of the abundance of white-tailed prairie dogs in these locations (Chihuahuan Desert Research Institute 1976). Prairie dogs are the ferrets' main food source (Clark 1975). Ferrets are also believed to prey on golden-mantled ground squirrels, insects, and Richardson ground squirrels (Snow 1972b).

American Peregrine Falcon. Peregrine falcons make use of the Sandy area; however, sightings are rare, and site-specific information is unavailable (per. comm., Randall 1975).

Peregrine falcons are migratory to a large extent, but it is not known if those in the Sandy area are migratory or yearlong residents. Raptor nesting habitat is plentiful in the area (Chihuahuan Desert Research Institute 1976). The peregrine's principal foods are perching birds, shorebirds, and waterfowl.

Cliff nesting is preferred, but occasionally the falcons nest on river-cut banks and sand dunes. Peregrine falcons nest along the Green River in cliff banks (per. comm., Wyoming Game and Fish Department 1975). The nests consist of shallow scrapes, usually on cliff ledges, and a startled bird could easily dislodge eggs when leaving the nest. Favorite cliffs seem to be high and above water (Hickey 1942).

Peregrines apparently have very few predators; however, nests are occasionally destroyed by predators (Snow 1972a). Man is this falcon's major enemy, and human harassment during nesting time is the most serious factor (Snow 1972a).

Aquatic Wildlife

Aquatic wildlife habitat is found primarily on streams which flow throughout the Sandy area (MAP 2-5, water resources section). About 39% or 143 miles of the total 368 miles of stream flow through national resource lands (TABLE 2-52), and an additional 12% (46 miles) of these streams are on Bureau of Reclamation lands upon which BLM manages livestock grazing programs.

The upper reaches (see Glossary) of these streams are habitat for cool water game fish. In the lower reaches of these streams, the water warms and warm water non-game fish predominate. The Green River, which forms the western boundary of the area, is considered a "blue ribbon"trout stream (Banks, et al. 1974).

The Wyoming Game and Fish Department manages fish populations and sport fishing in the area. Each year the department provides a fishing season and daily limits for the streams. Department personnel stock streams where heavy recreation pressure exists.

Based on electrofishing samples conducted by the Wyoming Game and Fish Department, typical trout populations on the upper reaches of most streams range from 600 to 3,500 fish per mile. Typical trout populations in the lower reaches of these streams range from 0 to 500 per mile (TABLE 2-53). Brook trout is the most prevalent of the species occurring in most streams (TABLE 2-54).

A stream habitat inventory conducted by BLM during the summers of 1975 and 1976 evaluated stream channel stability, resident habitat (pool frequency and size), and spawning potential for salmonids (trout species) for streams of major significance on national resource land in the Sandy area. Survey criteria (Wyoming BLM Manual Supplement 6671, Release 6-4), summarized data, and survey information are available for review in the Rock Springs District Office.

The wide distribution of NRL stream reaches throughout most drainages represents a cross-section of area-wide stream habitat conditions. TABLE 2-55 displays salmonid (trout) spawning and resident habitat data collected during the inventory.

From this data, generalizations can be made about the habitat for the entire area (TABLES 2-55 and 2-56 and MAPS 2-28 and 2-29 which are located at the end of this chapter). Seventy-eight percent of the Sandy area streams provide poor to virtually no spawning habitat for fish. Thirteen percent of the streams provide good resident habitat, while 26% are in poor condition or have virtually no resident habitat.

With the exception of the Green River and lower Big Sandy River, most streams in the area are low in mineral nutrients with conductivity readings of 60 micromhos or less. Those streams, therefore, are highly dependent upon additions of terrestrial vegetal litter for the major portion of their energy budget and food base (Vannote 1975, Cummins 1975).

Water quality within the Sandy area is generally suitable for most aquatic organisms. No threatened or endangered aquatic organisms have been identified in the Sandy area to date. Overall quality tends to decline as conductivity, temperature, and turbidity levels progressively increase after streams leave the montane and foothill areas and traverse the more open and sedimentary bottoms of the cold desert plains. Lack of full bank development and an adequate riparian shade canopy also result in a progressive deterioration of fish habitat downstream. Summer water temperature maximums in excess of 20°C limit salmonid habitat in the lower two-thirds of the Big and Little Sandy Rivers and Pacific Creek.

The following descriptions of streams by proposed allotment illustrate existing baseline conditions at the time of the stream survey. Refer to TABLE 2-56 for a habitat quality breakdown by allotment. Detailed information on the stream habitat inventory is available for review in the Rock Springs District Office.

Little Colorado Allotment

The lower Big Sandy River transects the southern third of this allotment, extending 40 miles from the Green River to the town of Farson. This reach of stream is high in nutrients with conductivities between 1,000-2,500 micromhos. It has seasonally low fair to good resident trout habitat throughout. Major limiting factors for salmonids are the summer temperature maximums (due to the lack of a riparian shade canopy) and excessive

TABLE 2-52

MILES OF STREAM HABITAT IN THE SANDY AREA

Sandy Drainage	NRL	Bureau of Reclamation	State	Private	Total
Big Sandy River	14.75	23.50	21.75	36.00	96.00
Bone Draw	1.00		0.25		1.25
Little Sandy River	8.25	2.00	8.75	29.25	48.25
Pacific Creek	17.75	3.00	8.50	3.75	33.00
Jack Morrow Creek	22.50		3.00	3.00	28.50
Dutch Joe Creek	2.25			1.00	3.25
Squaw Creek	1.00		1.25	1.25	3.50
Grass Creek	1.50			1.00	2.50
TOTALS	69.00 (32%)	28.50 (13%)	43.50 (20%)	75.25 (35%)	216.25
Sweetwater Drainage	**NRL**		**State**	**Private**	**Total**
Sweetwater River	14.00		5.00	12.50	31.50
Blucher Creek	2.00		1.75	7.00	10.75
Gold Creek	4.25		1.50	0.50	6.25
E. Fork Sweetwater	4.75		0.25		5.00
Lander Creek	1.75		1.00	2.50	5.25
Fish Creek	3.25		1.75	5.75	10.75
Pine Creek	5.50		1.25	6.75	13.50
Little Sweetwater	1.25				1.25
Trib. A to L.S.	1.00				1.00
Willow Creek	0.50				0.50
West Willow Creek	1.00			1.00	2.00
Dead Ox Creek	4.25		0.25	1.00	5.50
Little Pine Creek	0.75			0.75	1.50
Jack Creek	2.50			0.50	3.00
Mill (E. Sweetwater)	3.00				3.00
Ord Creek	2.50			2.25	4.75
Clear Creek	1.50				1.50
Mill (Sweetwater Tr.)	0.50				0.50
Blair Creek	0.75				0.75
Tie Creek	1.50			0.25	1.75
Trib. A to Clear	0.50				0.50
Oregon Slough	4.00			2.00	6.00
TOTALS	61.00 (52%)		12.75 (11%)	43.00 (37%)	116.50
Green River	**NRL**	**Bureau of Reclamation**	**State**	**Private**	**Total**
Green River	13.00 (37%)	17.00 (49%)	2.00 (6%)	3.00 (9%)	35.00
GRAND TOTAL	143.00 (39%)	45.50 (12%)	58.25 (16%)	121.25 (33%)	367.75

TABLE 2-53

ESTIMATED TROUT POPULATIONS
UNDER PRESENT CONDITIONS BY ALLOTMENT

	Allotment	Estimated Game Fish (Trout) Populations Per Mile 1/
1.	Bar X	1,300
2.	Fish Creek	Unknown
3.	Gold Creek	200-1,320
4.	Little Sandy-Little Prospect	0-880
5.	Steamboat Mountain	None
6.	Little Colorado	1,000
7.	Red Desert	None
8.	Bush Rim	None
9.	Continental Peak	630-2,350
10.	Pacific Creek	0-1,500
11.	Sands	None
12.	White Acorn	700-3,430
13.	Prospect Mountain	100-1,220
14.	Reservoir	Seasonal
15.	Poston	Seasonal
16.	Pine Creek	2,930

1/ Further information is available upon request from the Rock Springs District Office.

TABLE 2-54

MAJOR FISH SPECIES IN STREAMS ON NRL

Stream	Fish Species	WY Game & Fish Dept.[1/] Stream Class Rating (1) Good - (5) Poor
Sandy Drainage		
Big Sandy River		
Above Buckskin Crossing	Brook, Brown, Cutthroat, and Rainbow Trout, Suckers, Whitefish	3
Above Farson	Brown, Suckers, Roundtail Chub, Speckled, Dace, Redside Shiners, Sculpins	4
Below Farson	Brown and Rainbow Trout, Suckers, Carp	4
Waterhole Draw		4
Squaw Creek	Brook Trout	4
Dutch Joe Creek	Brook Trout	4
Grass Creek	Brook Trout	4
Little Sandy River	Brook, Brown, Rainbow, Cutthroat Trout	4/3
Pacific Creek	Brook Trout	4
Jack Morrow Creek		5
Parnelli		5
Rock Cabin		5
North Pacific		5
Dry Sandy		5
Hay		4
West Fork Hay		4
Sulphur		5
Green River Drainage		
Below Fontenelle Dam	Redside Shiner, Fathead Minnow, Rainbow, Flannelmouth Sucker, Mountain Whitefish, Speckled Dace, Bluehead Sucker, Mottled Sculpin, Mountain Sucker, Brown Trout, Carp, Roundtail Chub, Utah Chub, White Sucker, Kokanee, Lake Trout	1
Sweetwater Drainage		
Willow #3	Brook Trout	3
West Willow Creek	Brook Trout	4
Fish Creek	Brook Trout	4
Oregon Slough	Brook Trout	4
Pine Creek	Brook Trout	4
Dead Ox	Brook Trout	4
Little Pine Creek	Brook Trout	4
East Sweetwater	Brook, Rainbow, Cutthroat Trout	3
Gold Creek	Brook, Cutthroat Trout	4
Jack Creek	Brook Trout	3
Mill (E. Sweetwater)	Brook Trout	4
Lander Creek	Brook Trout	3
Blucher Creek	Brook Trout	3
Ord Creek	Brook Trout	5
Little Sweetwater	Brook Trout	3
Clear Creek	Cutthroat Trout	4
Mill (Sweetwater Trib.)	Brook Trout	4
Blair Creek	Brook Trout	4
Tie Creek	Brook Trout	-
Wolf Creek	-	-
Sweetwater	Brook, Brown, Rainbow, Cutthroat Trout	3

1/ Reference: Wyoming Game and Fish Department stream class rating system.

TABLE 2-55

INVENTORIED TROUT HABITAT QUALITY ON MAJOR STREAMS ON NATIONAL RESOURCE LANDS

	Spawning Habitat (miles) 1/				Resident Habitat (miles) 1/				TOTAL
	Good	Fair	Poor	Virt. None	Good	Fair	Poor	Virt. None	(Miles)
Sandy Drainage									
Big Sandy River		2.00	11.75	1.00	3.50	11.25			14.75
Bone Draw			1.00				1.00		1.00
Little Sandy River		2.50	5.25		2.50	5.25			7.75
Pacific Cr.			7.00	9.00		4.50	8.00	3.50	16.00
Jack Morrow Cr.				9.00				9.00	9.00
Dutch Joe Cr.	0.75		1.50		0.50	1.75			2.25
Squaw Cr.	1.00				0.75	0.25			1.00
Grass Cr.			0.25			0.25			0.25
TOTALS	1.75 3%	4.50 9%	26.75 51%	19.00 37%	7.25 14%	23.25 45%	9.00 17%	12.50 24%	52.00
Sweetwater Drainage									
Sweetwater River	2.75	1.25	7.25		7.25	4.00			11.25
Blucher Cr.			1.50			1.50			1.50
Gold Cr.				4.25		3.25	1.00		4.25
E.Fk. Sweetwater	0.25	0.50	4.00			4.75			4.75
Mill Cr.(E.Fk.Trib.)	2.25	0.75				2.00	1.00		3.00
Jack Cr.(E.Fk.Trib.)		0.75	0.50	1.25		2.00		0.50	2.50
Little Sweetwater	0.50	0.75				1.25			1.25
Trib.A-Little Sweetwater	0.75	0.50				1.25			1.25
Clear Cr.		1.00	0.25			1.25			1.25
Trib.A-Clear Cr.			0.50		0.50				0.50
Mill Cr.-Sweetwater Trib.				0.50				0.50	0.50
Blair Cr.				0.75		0.75			0.75
Tie Cr.	0.50		1.00			1.50			1.50
Lander Cr.				1.25		1.25			1.25
Fish Cr.		2.05	0.10	0.20		1.50	0.85		2.35
Pine Cr.	2.55		0.75			3.30			3.30
Little Pine Cr.				0.75		0.75			0.75
Dead Ox Cr.		0.25	0.25	3.50		0.25	0.25	3.50	4.00
Willow Cr.		0.50				0.50			0.50
West Willow Cr.		1.00				1.00			1.00
Ord. Cr.			0.75	1.75		2.50			2.50
TOTALS	9.55 19%	9.30 19%	16.85 34%	14.20 28%	7.75 16%	34.55 69%	3.10 6%	4.50 9%	49.90
Green River				13.00		13.00			13.00
GRAND TOTAL 2/	11.00 (10%)	14.00 (12%)	44.00 (38)	46.00 (40%)	15.00 (13%)	71.00 (62%)	12.00 (11%)	17.00 (15%)	115.00

1/ As determined by the Wyoming BLM 6671 Stream Survey Manual Supplement, Appendices 6, 7, and 8.

2/ Rounded off to nearest mile.

TABLE 2-56

ESTIMATED FISH HABITAT POTENTIAL UNDER PRESENT CONDITIONS BY USE AREA

				Spawning Habitat Potential								Resident Habitat							
	Total Stream Miles	NRL Total Stream Miles	NRL[4/] Miles Inventoried	Good Mi.	%[2/]	Fair Mi.	%[2/]	Poor Mi.	%[2/]	Virtually None Mi.	%[2/]	Good Mi.	%[2/]	Fair Mi.	%[2/]	Poor Mi.	%[2/]	Virtually None Mi.	%
1. Bar X	9.00[1/]																		
2. Fish Creek	5.50	2.50	1.85			5.50	100%							3.25	59%	2.25	41%		
3. Gold Creek	44.00	33.75	33.50	11.40	26%	9.24	21%	12.76	29%	10.56	24%	6.16	14%	33.00	75%	2.64	6%	1.76	4%
4. Little Sandy/ Little Prospect	42.25	11.25	8.45			2.54	6%	28.73	68%	10.99	26%	2.54	6%	39.72	94%				
5. Steamboat Mountain	9.50[1/]	6.50																	
6. Little Colorado	60.25	16.50	23.50					27.11	45%	33.14	55%			57.84	96%	2.41	4%		
7. Red Desert	0																		
8. Bush Rim	0																		
9. Continental Peak	6.00[1/]	4.25	0.25			0.25	100%							0.25	100%				
10. Pacific Creek	48.00	32.00	24.00					12.96	27%	35.04	73%			7.20	15%	15.84	33%	24.96	52%
11. Sands																			
12. White Acorn	17.75	7.05	3.00	3.02	17%			14.73	83%					17.75	100%				
13. Prospect Mountain	27.75	9.75	8.50	2.50	9%	13.04	47%	12.21	44%			19.70	71%	8.05	29%				
14. Reservoir	14.50	1.00	1.00							14.50	100%			14.50	100%				
15. Poston	0																		
16. Pine Creek	10.50	6.25	4.55	0.74	7%	0.53	5%	2.31	22%	6.93	66%			3.05	29%	0.53	5%	6.93	66%
ALLOTMENT TOTALS	295.25 - 24.50[1/] 270.75[3/]	130.80	108.60	17.66 7%		31.10 11%		110.81 41%		111.16 41%		28.40 10%		184.61 68%		23.67 9%		33.65 12%	
Custodial Pastures																			
C-6		1.00	1.00					0.39	39%	0.61	61%			1.00	100%				
C-21		2.00	0.80							2.00	100%			2.00	100%				
C-26		1.25	1.25	1.00	80%			0.25	20%			0.75	60%	0.50	40%				
Palmer Draw		3.00	3.00					3.00	100%			3.00	100%						
CUSTODIAL AND NO GRAZING TOTAL		7.25	6.05	1.00	14%			3.64	50%	2.61	36%	3.75	52%	3.50	34%				
GRAND TOTAL		138.05	114.65	18.66		31.10		114.45		113.77		32.15		188.11					

1/ Miles deleted due to nonfisheries habitat, unknown condition, or totally nonNRL stream.

2/ Percentages based on condition distribution of NRL miles surveyed.

3/ Total miles for weighted habitat condition estimates.

4/ NRL inventoried miles extrapolated to include total stream miles.

stream bottom sedimentation (55 to 90%). The latter results in poor to virtually no salmonid spawning potential and covers required substrate (gravel and rubble) for production of bottom dwelling food organisms. Populations of trout are known to exist in this reach of the Big Sandy when temperature levels are acceptable, especially in the 8 to 10-mile region of cold water bank seeps below Farson. Some of these seeps create quarter- to half-mile reaches of perennial cold water streams (e.g., Bone Draw) which feed the Big Sandy and offer the only potential salmonid spawning habitat on the lower river.

This reach of the Sandy is also of major importance for nongame fish, primarily minnow and sucker species, which migrate upstream from the Green River in April and May in order to spawn in the extensive deposits of sand and fine gravel lining the river bottom. Three nongame fish species which inhabit the lower Sandy (roundtail chub, flannelmouth sucker, and bluehead sucker) have been noted by Baxter and Simon (1970) to be "still quite abundant in certain areas (within Wyoming), but their ranges have been clearly reduced in the past two decades, such that they should be considered, if not actually rare, certainly in need of consideration from the point of view of conservation and even preservation"

The high sand content of the banks along this stream makes them less than 50% stable to livestock pressures and highly susceptible to loss of cover habitat through bank shearing and trampling. Presently 10 to 25% of the banks along this reach of stream are receiving damage from livestock. Less than 10% bank damage would allow for the establishment of suitable habitat conditions. Numerous stands of young willows along the river provide very little shading, overhead cover, or bank stability as present grazing pressures limit heights to 12 to 20 inches (FIGURES 2-33, 2-34, and 2-35).

The Green River forms the western boundary of the Little Colorado Allotment and is generally considered a "blue ribbon"trout stream. Major factors presently limiting trout production to 9 pounds per acre, versus a potential of 50 to 100 pounds per acre, are sedimentation and biological factors related to stream flow fluctuations below the Fontenelle Reservoir (Banks et al. 1974).

Sediment generated from the critical and active erosion areas in canyons of the Green River east bank reduces spawning potential and food production (insects). High spring flows flush these sediments from the river bottom and they eventually settle out in the inlet of the Fontenelle Reservoir. This is creating a delta in the head end of the reservoir which is more productive for waterfowl and nongame fish than for game fish. The cleared water leaving the Fontenelle Reservoir once again picks up sediment from two sources—along the Green River-Slate Creek on the west bank and especially the Big Sandy River drainage on the east bank (FIGURE 2-36).

In contrast to the situation above the reservoir, regulated discharges below the reservoir reduce the effectiveness of spring flushing of the stream bottom, resulting in gradual cementation and particle packing of gravel and rubble by sediment accumulations. This limits salmonid spawning habitat potential to its present poor condition and also limits the production of bottom-dwelling food organisms.

The contribution of high levels of dissolved solids contributed by the Big Sandy to the Green River effectively doubles the conductivity, or basic productivity, of the Green River below the confluence (BLM stream survey 1975). These increases contribute to a downstream change in the water chemistry and biological cycles of the Green River and ultimately the Flaming Gorge Reservoir.

Reservoir Allotment

The Big Sandy River above the Big Sandy Reservoir, Station 64 (mile marker) to Station 75, falls within the Reservoir Allotment. This reach of stream primarily supports brown trout (temperature permitting) and nongame fish. Pool size and frequency create a fair resident habitat for salmonids, but there is virtually no spawning potential because of silt and sediment accumulations covering over 90% of the stream bottom.

Fragile, active, and critically eroding watersheds (BLM 1975) adjacent to the river contribute to the sedimentation problem as well as mass wasting of streambanks, which are composed of sandy gravels and have less than 50% stability for livestock pressures due to the lack of deep rooted shrub vegetation such as willows. Present livestock damage to streambanks in this reach is less than 5%. The wide channel (30 to 40 feet), shallow depth (12 inches), and lack of shading canopy (less than 5%) create a situation where maximum summer temperature (in excess of 20°) becomes a limiting factor for salmonids, but it is favorable for minnow and sucker species.

Poston Allotment

The reach of the upper Big Sandy (from Stations 75 to 98) forms a common boundary between the Poston and Prospect Allotments. This reach of stream is capable of supporting salmonids and cyprinids, but salmonids are limited by summer temperatures in excess of 20°C). While the channel stability is low fair to poor, fair resident fish habitat with virtually no salmonid spawning potential exists since bottom sedimentation is still in the range of 45 to 60%. Low bank protection by vegetation, mass wasting, and cutting are major factors affecting aquatic habitat in this reach. The sandy loam streambanks have less than 50% stability for livestock pressures and are presently experiencing only 3% bank damage. The lack of channel confinement by bank stabilizing deep-rooted shrubs such as willow has allowed the stream, on the average, to widen to 50 feet and decrease in depth to only 5 inches.

Prospect Mountain

The upper Big Sandy flowing through the Prospect Mountain Allotment varies with fair to good resident habitat and poor to fair spawning potential for salmonids.

FIGURE 2-33 LOWER BIG SANDY RIVER OVERVIEW. Note mass wasting on far bank, lack of shading, vegetative differences on island shoreline vs. streambanks, and the portion of riparian zone which is salting out.

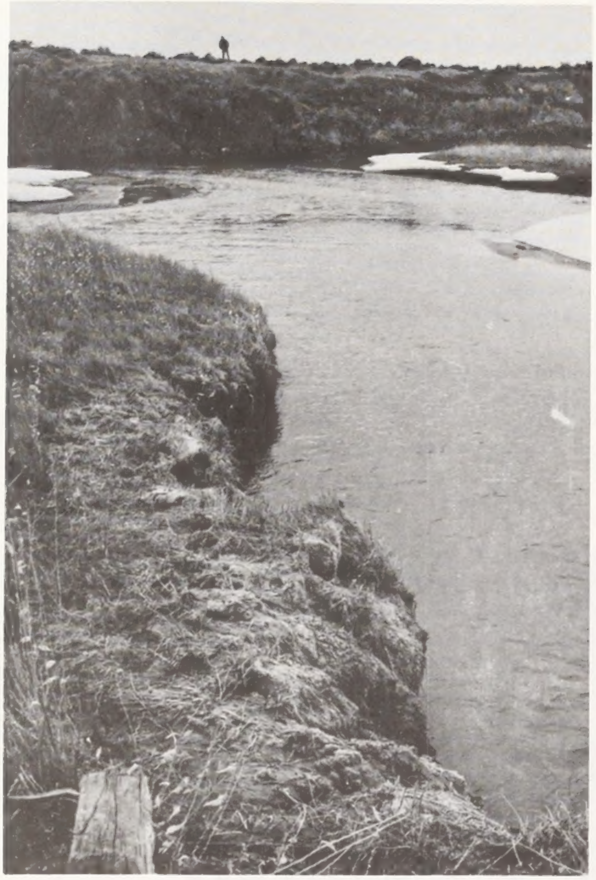


FIGURE 2-34 LOWER BIG SANDY STREAMBANK. Note the loss of overhanging bank habitat through livestock trampling and bank sloughing. The high sand content, moderate vegetative stabilization and lack of deep rooted woody vegetation (willows) make these banks less than 50% stable to livestock pressures.

FIGURE 2-35 WILLOWS ALONG LOWER BIG SANDY RIVER. Note utilization intensity and resulting lack of shading or bank stabilization.

FIGURE 2-36 SEDIMENT LOAD. This aerial photo, following a rainstorm, shows the sediment load in the Big Sandy River (right) as it meets the Green River (left).

Increased channel stability (high fair to good) and reduced levels of sedimentation (5 to 20%) are the prime factors producing this change.

Bank stability for livestock trampling is unstable to less than 50% stable due to bank soils of relatively shallow sandy loam underlain by rubble and boulders. Present factors limiting the quality of aquatic habitat are the lack of adequate bank protection by vegetation, bank cutting, mass wasting, and bank damage as high as 70% by livestock in site specific areas.

Little Sandy-Little Prospect Allotment

The Little Sandy River courses north to south through the Little Sandy portion of the proposed allotment. The last 25 miles are within the Eden Valley Irrigation Project. Spawning habitat throughout the lower 43 miles is characteristically poor with sedimentation as high as 90% in two-thirds of this reach. A poor distribution between fine gravels and large rubble or boulders in the upper reaches also limits spawning habitat to poor as proper size gravels are limited. Resident habitat is high fair throughout and attains a good condition in the upper reaches where pool size and frequency are almost optimum. Livestock damage to banks is as high as 60% and averages 30 to 40%. This reduces productivity of fisheries habitat through loss of bank overhangs, loss of protection by vegetation, and sedimentation from accelerated bank erosion (FIGURE 2-37). Game fish in the Little Sandy include brook, brown, rainbow, and cutthroat trout which are found in the upper half of the drainage. The sedimentary banks on this stream are generally sandy loam overlying gravel or rubble that has an inherently low stability to ungulate pressures.

Pacific Creek-Steamboat Mountain Allotments

Jack Morrow Creek heads at spring sources in the Steamboat Allotment and flows northwest through the Pacific Creek Allotment to its confluence with Pacific Creek. This stream is not suitable for salmonids due to low flows which simply maintain pool habitat in the lower 10 miles before Pacific Creek. Its primary values lie in habitat for nongame fish, mostly minnow species (cyprinids) which inhabit the pools, and as a wet bottom habitat for wildlife. Jack Morrow Creek is a partial contributor to the sediment load entering the lower Big Sandy because bank cutting and mass wasting are frequent throughout most of the stream (FIGURE 2-38).

Emergent riparian vegetation is stabilizing the lower banks in many reaches of the stream, but bank erosion is accelerated in site specific areas where ungulate damage approaches 50%. In some areas, this stream has created marsh conditions. The marshes serve as a waterfowl food production area and a filter for sediments, thus reducing a portion of the sediment entering Pacific Creek.

Pacific Creek flows along the northern edge of this allotment parallel to State Highway 28. The lower half of this creek (below the State lands) has little to fair resident habitat with poor spawning potential for salmonids. Sixty to 100% of the bottom is silted, making this reach most suited to the cyprinids which populate the lower half of the creek. Lack of bank protection by vegetation, cutting, mass wasting and livestock damage greater than 50% in specific areas along the creek contribute to bank instability and poor habitat conditions in this reach. Pacific Creek above the State lands (Stations 30-35) is populated by brook trout and has an improved habitat consisting of predominately fair resident pools with poor spawning potential. Sediment accumulations of 45 to 85% still limit spawning quality, but bank protection by grasses and forbs in this wet meadow bottom is quite good. Livestock damage to banks is less than 5%, and the stream in this area supports large numbers of waterfowl and wetland birds.

Bar X, Gold Creek, Pine Creek, White Acorn, and Fish Creek Allotments

These five allotments encompass all of the streams of the Sweetwater drainage within the Sandy area. Most of these streams (TABLES 2-55 and 2-56) are quite similar in nature, having channel stability ratings and resident salmonid fisheries habitat of fair to good quality and poor to good spawning potential. Being in a predominately montane area, these streams vary in quality and stability as they flow from confined bottoms of exposed bedrock to broad depositional meadows where riparian vegetation plays a key role in maintaining fisheries habitat. The confined bedrock bottoms are generally high in channel stability, good in resident habitat, fair in spawning potential, and low in livestock damage. In contrast, reaches flowing through the wider depositional meadows generally have reduced channel stability, fair resident fisheries habitat, poor spawning habitat, and increased livestock bank damage associated with intensive use of these more desirable areas. All four of the major trout species in this area (brook, brown, rainbow, and cutthroat), as well as numerous nongame species, are found in these streams.

The major limiting factors affecting resident fish habitat in these streams are bank protection from vegetation in areas of bank cutting, mass wasting, and an associated accelerated sedimentation of spawning and food-producing gravels (FIGURES 2-39, 2-40, and 2-41).

Reservoirs

There are numerous small reservoirs scattered throughout the Sandy area (MAP 2-4) which function primarily as stock water reservoirs. These standing waters and their aquatic communities create an important early season resource base for the production of food organisms (invertebrates) and nesting sites for waterfowl and other birds common to the aquatic environment. Presently a reservoir standing water inventory has not been conducted and the condition of aquatic habitat on standing waters has not been quantified. Cursory field observations have indicated that the majority (75%) of these reservoirs have relatively low productivity due to

FIGURE 2-37 LITTLE SANDY RIVER. Note high degree of sinuosity, low density of riparian willows, and full exposure to warming by solar radiation in this photo between Stations 30 and 40.

FIGURE 2-38 JACK MORROW CREEK. Note extensive sediment producing cutbanks, small channel, and protective vegetation covering the lower banks.

FIGURE 2-39 GOOD HABITAT. Good channel stability and resident fish habitat shown in this photograph of the Sweetwater River is due to high bank stability, overhead cover, shading, and minimal bank erosion.

FIGURE 2-40 STREAMBANK EROSION. Natural erosion (left) along the Sweetwater River is contrasted with the erosion accelerated by livestock (right).

FIGURE 2-41 DEPOSITIONAL MEADOWS. Found in the Sweetwater Drainage, these meadows have low bank stability to undercutting if bank stability by deep-rooted shrubs (willows) is reduced.

livestock utilization of the riparian vegetation right down to the waterline. Increased turbidity (due to wave action on unstable shorelines) also appears to limit the development of primary producers (algae) and consumers (plankton and insect larvae) in these reservoirs. Three major reservoirs in the Sandy area provide game fish habitat: the Eden Reservoir (inside the irrigation project), the Sandy Reservoir (Reservoir Allotment), and the Fontenelle Reservoir (Little Colorado Allotment).

The Eden and Sandy Reservoirs are major irrigation water storage reservoirs for the Farson-Eden project. The former is a relatively shallow reservoir (15 feet) which may winterkill and, therefore, to date has not been considered as a prime area for fisheries management by the Wyoming Game and Fish Department. Fish common to both the Big and Little Sandy Rivers are present in the reservoir, and Wyoming Game and Fish Department plans call for experimental stocking of the reservoir with game fish (trout) in 1976 (per. comm., Dunning 1976).

The Big Sandy Reservoir maintains populations of game fish (rainbow and brown trout), but high turbidity and sediment loads presently limit primary production levels to approximately 50% of those existing at the time of reservoir construction. Quantitative or qualitative data on this reservoir presently are limited.

A recent investigation of the Fontenelle Reservoir by the Wyoming Game and Fish Department (McKnight 1975) noted the following conclusions: "Nongame fishes are sharing the ecosystem niches without imposing eminent (sic) threats to the salmonid fisheries. Limited habitat within the system has affected the strongest restraints on game and nongame recruitment and abundance. Both segments of the total fish community successfully replenish their densities through movement and recruitment in the upstream river habitats. Nongame fishes prevail over game fishes in both reproductive potential and abundance; although population densities and distribution have remained relatively static in recent years.... The most serious competition in the river occurs during winter dependence upon forage and space in the limited pools.... Game fishes of the river-reservoir complex are sparsely abundant and are largely regulated by low productivity and limited habitat—especially winter habitat in the river.... Population densities are largely self-regulating through the mechanism of numerical adjustment to productivity and suitable habitat instead of growth adjustments"

WILD HORSES

Due to provisions of Public Law 92-195, "Wild, Free-Roaming Horse and Burro Act,"and the lack of fencing, wild and stray horses roam freely over the majority of the Sandy area. The wild horses are descendants of feral (see Glossary) animals that have been in the area since at least the early 1900's; exact dates are not known.

The Sandy area currently has two major wild horse management units, separated by U.S. Highway 187 (MAP 2-30, located at the end of this chapter). These two units are referred to as the Little Colorado, located west of U.S. 187, and the Continental Peak, east of U.S. 187.

Horses have minimal access to the area north of Wyoming Highway 28 since the highway is fenced. However, a small band of horses is known to be located in the Gold Creek Allotment and roam onto the adjacent national forest land during the summer.

Population

The most current inventory (February 1976) indicates the presence of more than 500 horses in the Little Colorado Unit, over 1,000 horses in the Continental Peak Unit, and 12 horses in the Gold Creek Allotment (TABLE 2-57). This reflects an increase of 325 horses in the Little Colorado Unit and 597 in the Continental Peak Unit from the 1972 inventory. An increase of three horses has occurred in the Gold Creek Allotment since the 1974 inventory. TABLE 2-58 reflects the wild horse populations at the present time in each allotment in the Sandy area.

The inventories indicate an extreme fluctuation (11 to 103%) in the rate of increase of horses in these areas. Various things could contribute to these fluctuations. One is the lack of restriction of the horses to herd areas. Highway 187 is fenced only as far south as the checkerboard land pattern line, which itself is not fenced; therefore, Little Colorado horses can drift into the checkerboard and the Continental Peak area, and vice versa. Little Colorado horses also drift through open gates to the Pinedale Resource Area north of the Sandy area. Open gates and fencing in poor condition along the Rock Springs-Rawlins district boundary fence through the Red Desert allow horses to cross back and forth. Another factor for fluctuations in population increases could be undetected overnight movement of the horses, since it takes several days to conduct the aerial inventory.

Informal, random counts in the summers of 1974 and 1975 throughout the area indicated an average foal crop of 26%. There is no definitive data on foal crop or mortality for these herds. It is, therefore, impractical to try to calculate a rate of increase for the herds in either of these areas. A more realistic view of horse numbers may be seen when considering the total area of free movement (TABLE 2-59). This would include both the Little Colorado and Continental Peak Units, as well as the checkerboard lands north of Interstate 80. Horse movement in and out of this total area is believed to be minimal.

The peak foaling period is early May to mid-June, though the period ranges from April to September. Observations over the past five years by BLM personnel indicate the herds have an approximate sex ratio of 50% males to 50% females. This may vary as much as 10% either way. The age structure of the herds is not known. Ages range from the current year's foals to a mare over 20 years old captured in the late summer of 1975.

Individual animal size at maturity generally is between 800 and 1,000 pounds with extremes of 1,500 pounds for

TABLE 2-57

WILD HORSE INVENTORIES

Inventory Date	Little Colorado Unit	Continental Peak Unit	Gold Creek Allotment	Total
January 1972	213	535	0	748
February 1974	247	751	9	1,007
February 1975	265	860	10	1,135
February 1976	538	1,132	12	1,682

TABLE 2-58

PRESENT WILD HORSE POPULATIONS AND USE BY ALLOTMENT

Allotment	Populations*	Actual Use in AUMs
Gold Creek	12	144
Steamboat Mountain	42	504
Little Colorado	538	6,456
Red Desert	583	6,996
Bush Rim	184	2,208
Continental Peak	170	2,040
Pacific Creek	96	1,152
Sands	57	684
TOTAL	1,682	20,184

*Data from February 1976 inventory.

draft horse types to 350-pound Shetlands. The draft horse influence is also evident in some horse conformation.

Solid colors predominate in both herds; but numerous variations occur, including pintos, Appaloosas, roans, and greys.

Distribution and Movement

Although horses can range freely over most of the Sandy area, major concentrations occur only in certain locations (MAP 2-30). Some areas in the Little Colorado, Red Desert, Bush Rim, Continental Peak, and Sands Allotment (MAP 2-30) are used yearlong with migrations occurring during extreme weather conditions. In areas where seasonal movements appear to occur, the horses utilize higher country during the summer and lower country during the winter. Summer ranges are tied to water availability; however, horses eat snow during the winter. Based on observations by BLM personnel and a limited study during the summer of 1974, it appears that a band of approximately ten horses ranges over a 36-square mile area during a one to three-month period. The largest range noted was 6 by 10 miles and the smallest was 3 by 6 miles. It was noted horses will travel 10 miles to water. Each "home range"is occupied by several bands which graze in close proximity to each other and migrate as a group.

Winter bands may be composed of as many as 20 or 30 horses. During the spring and summer season, the numbers of horses per band will vary from 1 or 2 to 12 or 15.

Groups of bands totaling 60 to 80 horses can be seen grazing together during the summer with as many as 125 in the immediate vicinity of a watering place in the evenings. Groups totaling 80 to 120 horses are occasionally seen during winter inventories.

Band composition changes often. The large numbers of horses, large ranges, long-distance trailing, and movement among bands make it difficult to determine specific bands and their home ranges on a large scale in the Sandy area.

Habitat Requirements

The primary habitat for the horse population in the Sandy area is in the sagebrush-grass and saltbush vegetation types (MAP 2-8). Fecal analyses are being conducted in cooperation with Colorado State University. Although the results are limited, since samples for only 1½ years have been analyzed, they serve as an indication of what the Sandy area's wild horses are eating. The horses' diet is predominantly grass, but it varies by season: 98% grass in the spring, 94% in the summer, 73% in the fall, and 84% in the winter (TABLE 2-60). Browse makes up an appreciable portion of the diet only in the fall and winter. Based on TABLE 2-58, the horses counted in the 1976 inventory required 20,184 AUMs of forage per year (1,682 horses X 12 months).

An adult horse will normally consume 10 to 12 gallons of water per day (Morrison 1961). Horses in the area usually have adequate water from winter snows and spring runoff filling reservoirs and intermittent streams. During late summer and early fall, the horses depend on the fewer perennial sources of water (some reservoirs, streams, springs, and flowing wells) and on wells in the north portion of the Little Colorado that are pumped for domestic livestock.

Horses traveling distances up to 10 miles to water have been noted, although 2 to 5-mile distances are more common. Several hundred horses may water at a flowing well in an afternoon and evening. Vegetation in the vicinity of these watering places with concentrations of wild horses, livestock, and wildlife is being destroyed by overgrazing and trampling as the animals trail in and out for water.

Since there are no trees or large shrubs in the areas these horses utilize, the only cover is on the lee slopes of ridges and breaks. Sagebrush in these areas sometimes reaches 4 feet in height, but 2 to 3 feet high is more common. During the winter many of these are drifted over with snow. At this time, horses can be found on windswept hillsides and ridges, even during high winds with temperatures around zero, as well as in the more protected bottoms. During the summer the horses use the ridges and slopes to be in the wind and to get away from insects. There are no willows or trees along streams for refuge, but the horses do wallow in the mud if any is available at a watering place to help combat insects.

PALEONTOLOGICAL RESOURCES

The Sandy area contains some of the most important vertebrate fossil locations in the United States. The Bridger Basin is considered the classic Middle Eocene collecting ground in the world. The Eocene Period (58 million to 36 million years ago) is divided into four ages: Wasatchian (Early Eocene); Bridgerian (Middle Eocene); Uintan (Late Eocene); and Duchesnian (Very Late Eocene). In the Sandy area, deposits of the Wasatchian and Bridgerian are found.

One of the best-known deposits of fossil fish in the United States occurs over an extensive area northeast of Farson in the Little Sandy-Little Prospect Allotment. The fish are primarily two fresh water herring genera, *Knightia and Diplomystus,* which occur in the Laney Shale that was part of Lake Gosuite 45 and 50 million years ago. Fragments of catfish in the area are considered significant.

Since it is known that paddlefish, garfish, stingrays, sturgeon, alligator, turtles, insects, birds, mammals, and plants occur in the Laney Shale at Fossil Butte National Monument near Kemmerer, Wyoming, these species may also occur in that formation in the Sandy area. Many of these fossils are significant because they are used for correlating and dating Tertiary (2 to 60 million years ago) deposits throughout the West, as well as substantiating temporal changes in the evolution and environment of the biotic community. Consultations with Dr. Paul

TABLE 2-59

WILD HORSE INVENTORIES IN COMBINED ACCESS AREAS*

Year	Number Counted
1972	1,187
1973	No Count
1974	2,319
1975	2,933
1976	4,085

*These figures are higher than numbers shown in TABLE 2-57 because they include horses in the checkerboard area south of the area that have access to the Continental Peak and Little Colorado management areas. They presently roam freely between the two areas (MAP 2-30).

TABLE 2-60

MAJOR PLANTS IN WILD HORSE DIET BY SEASON

	Spring (Percent)	Summer (Percent)	Fall (Percent)	Winter (Percent)
Grasses				
1. Needlegrass	65	31	8	68
2. Indian Ricegrass	16	9	8	0
3. Wheatgrass	8	45	28	16
4. Sedge	7	6	5	0
5. Bluegrass	2	0	0	0
6. Bromegrass	0	3	7	0
7. Fescue	0	0	9	0
8. June Grass	0	0	8	0
Forbs				
1. Globemallow	0	0	0	3
Shrubs				
1. Saltbush	1	0	14	0
2. Winterfat	0	4	12	3
3. Snowberry	0	0	0	4
4. Rabbitbrush	0	0	0	4
Other Species	1	2	1	2
	100	100	100	100

McGrew of the University of Wyoming revealed that any outcrop in the Sandy area has a potential for containing fossils. The potential for discovering significant new fossil beds is considered very high in the Wasatchian and Bridgerian Formations and the Laney Shale and Tipton members of the Green River Formation.

CULTURAL RESOURCES

Archeology

In the Sandy area there are numerous types of archeological sites based upon the activities that man performed on them. Communal kill sites usually are located near an area of good grazing where the topography is suitable for channeling animals over a cliff or into an arroyo, box canyon, steep sand dune, large snowdrift, or bog. Campsites can occur almost anywhere in the Sandy area; however, they tend to be near chert or quartzite quarry areas, water, sand dunes, and southeastern ridges. Stone rings usually cluster close to mountains and elevated areas. Petroglyphs occur on suitable rock outcrops, while quarries are located where lithic material satisfactory for artifacts is found.

Several factors have adversely affected the 103 known archeological sites in the Sandy area. These factors and the percentage of total sites impacted by each include: surface collecting, 81; erosion, 45; roads, 31; trampling, 28; construction, 17; fencing, 7; off-road vehicles, 7; pothunting and vandalism, 5; and sheepherder camps, 3 (TABLE 2-61). All of the sites have been intensively surface collected.

There are no archeological sites in the Sandy area currently on the National Register of Historic Places, based on a search of *Federal Register* issues (Volume 34, Number 34, Part II, and Volume 41, Numbers 3, 23, 28, 42, 67, 87, 106, and 130). However, several sites are potentially eligible on a national, state, or local level for nomination to the National Register by the Secretary of the Interior. In order to be considered for inclusion on the National Register a site must possess integrity of location, design, setting, feeling, and association. It should also be associated with events that have made a contribution to the broad patterns of history, yield information important in prehistory or history; embody the distinctive characteristics of a type, period, or method, or which will aid in chronological, technological, or settlement pattern studies *(Federal Register,* Volume 39, Number 4, Part II, page 6403). To meet these criteria, the site must be evaluated against similar sites to determine if it has acceptable depth of deposit, a reasonable size, and good preservation; although all sites have potential significance for various types of scientific studies.

On a letter dated June 1977 the State Historic Preservation Officer determined that Sandy area archeological sites potentially eligible for nomination to the National Register include (level of potential significance is in parentheses):

Finley Site (National Level)—Located in the Sands Allotment, this is the earliest known site in southwestern Wyoming (7,000 to 9,000 years before present). Parts of it were excavated in the 1940's (Metcalf 1976, Howard 1943, and Satterthwaite 1957). It is the type site for the Eden point, which is a diagnostic of the Cody Complex, and it may contain components of the Folsom Complex (see Glossary). According to the Wyoming State Archeologist, much subsurface material remains at this site.

Eden-Farson Site (State Level)—This is a large Shoshonean campsite and antelope trap located in the Sands Allotment. It contains the remains of at least 12 lodges and 200 antelope. It is the largest Shoshonean camp of its type excavated (Metcalf 1976, Frison 1971).

48 SW 305 (State Level)—Located in the Sands Allotment, this is a site deeply buried in sandy soil around a spring. Test pits have revealed Middle Period (see Glossary) occupation levels. Considerable material still remains, and the test pits did not reach the bottom of the deposit.

F.G. 10 (State Level)—This very extensive, deeply stratified site was found around a spring and wet meadow in the Bush Rim Allotment. Test pits have revealed Late Prehistoric and Middle Period materials.

F.G. 5 (Local Level)—This site in the Steamboat Mountain Allotment includes a large lithic scatter containing Archaic projectile points on a semistabilized sand dune near a spring. There is considerable depth to the site.

E.M. 4 (State Level)—This site features a heavy concentration of lithic material over a large area of sand dunes near Jack Morrow Creek in the Steamboat Mountain Allotment. There appears to be considerable depth of deposit.

F.G. 9 (Local Level)—A very large concentration of lithic material, including an Archaic component and fire-cracked rock, was found in this Steamboat Mountain Allotment site.

F.G. 7 (Local Level)—Found in the Steamboat Mountain Allotment, this site has a fairly extensive area of lithic material containing an Archaic component and fire-cracked rock with fair depth of deposit.

F.G. 4 (State Level)—This is a widespread area of lithic debritage (see Glossary) on a sand dune near the confluence of Jack Morrow Creek and a spring-fed drainage in the Steamboat Mountain Allotment. The site has good depth of deposit.

J.S. 4 (State Level)—This huge quarry area is near a spring in the Little Colorado Allotment. While most of the site is not stratified, parts of it appear to be buried. It could contain important information concerning lithic technology.

B.F. 1 (Local Level)—This is a large quarry on a knoll near the Blue Forest in the Little Colorado Allotment. Parts of this site have good depth of deposit.

The contract for an archeological sampling survey of the Sandy area was awarded to Western Wyoming College. Michael D. Metcalf conducted the survey, which included a literature search and a field search of 0.3% of the area. The survey procedures are available upon request from the Rock Springs District Office. The full

TABLE 2-61

CONDITION OF SELECTED ARCHEOLOGICAL SITES IN THE SANDY AREA BY ALLOTMENT*

			Factors Affecting Sites										
Allotment	Site	Physical Size (in Acres)	Vandalized (a)	Fenced (a)	Spring Developed (a)	Trampled	Erosion Caused by Trampling	Roads (a)	Improper Archeological Excavation	Construction (a)	Naturally Eroded	Sheepherder Camp (a)	Condition of Natural Setting (b)
Steamboat Mountain	FG-5	1				L		M		M			Good
Steamboat Mountain	EM-4	10				L					L		Excellent
Steamboat Mountain	FG-9	2				L		M					Good
Steamboat Mountain	FG-7	2				L		L			L		Excellent
Steamboat Mountain	FG-4	3				L				H	M		Fair
Little Colorado	JS-4	10				M		L				H	Fair
Little Colorado	BF-1	2				L		L				H	Fair
Bush Rim	FG-10	200			H	M		H					Good
Sands	Finley	160	H	L		M	M	L					Fair
Sands	Eden-Farson	10	H			L			H				Excellent
Sands	48 SW 305	5				L		L	H				Excellent

* Prepared after field examination by BLM archeologists. Condition is in high (H), moderate (M), and low (L) damage[a]:

H - Site is 75%-100% disturbed
M - Site is 25%-75% disturbed
L - Site is less than 25% disturbed

(a) The percentage for vandalism, fencing, spring developments, roads, construction, and sheepherder camps refer to damage to the site in the immediate vicinity of the factor affecting the site; i.e., the spring development at FG-10 has destroyed 75% of the cultural resources in the spring, but it has not affected the rest of the site. The percentage for trampling and erosion refer to damage over the surface of the entire site; i.e., most sites have the top few inches of about 10% of their surface destroyed by trampling.

(b) The condition of natural setting refers to the present condition of the site as it pertains to the historical condition. A site in excellent condition would have few signs of surface alteration and the land around it would be nearly like the original. A site in fair condition would have a number of signs of human or animal intrusion around it.

contract report is also available for review in that office. Metcalf's survey (1976), although only a cursory review because of the area covered, revealed the following points about the area (MAP 2-31, located at the end of this chapter):

1. An overwhelming number of sites are situated near permanent or nearly permanent water (TABLE 2-62). Over 60% of the sites presently known in the study area are situated next to streams, rivers, springs, and playas.
2. The sand dune area contains numerous sites.
3. On upland sites the most probable areas are around breaks and buttes.

A considerably larger survey is necessary to validate these preliminary results.

History

The major historical resources in the Sandy area are connected with historic trails, particularly the 190 miles of the Oregon Trail and its cutoffs (MAP 2-32, located at the end of this chapter). From 1839 to 1862 the Sandy area was the principal transcontinental corridor used for the settling of the West, and thus the trails and the area through which they passed became a major theme in American life with effects felt to the present.

There are 125 miles of secondary stage roads in the Sandy area. Settlement of the Sandy area began after the completion of the railroad, located 20 miles south of the area. Secondary stage roads were developed and ranches were established around permanent water sources.

A number of the historic stage stations, ranches, and emigrant camp sites also have potential for historical and archeological studies.

Historic sites can be included on the National Register if they are significant on a national, state, or local level and are over 50 years old (Volume 34, Number 34, Part II of the *Federal Register*). In a letter dated November 1, 1976 the State Historic Preservation Officer indicated that more field research relating to the fur trade was needed, as well as more research into the agriculture and livestock industry of the area. Further studies cannot be provided in the FES because of the short timeframe left to complete the FES.

Two sites in the Sandy area are on the National Register of Historic Places:

South Pass—At this point the emigrants on the Oregon Trail were officially in Oregon Territory, halfway through their journey, and across the Continental Divide, thereby making the area the major landmark on the trail (Haines 1973). This site is in the Pacific Creek Allotment.

Access is by a well-developed two-track road approximately two miles from a paved highway. Some tourists visit the site annually. An interpretive sign is located along the highway, overlooking the area. Around 40 acres are fenced with a wooden fence. Inside are several markers which commemorate the Whitman Party. The historic setting for the site is rated as only good due to the surrounding construction.

Parting of the Ways—This is the dividing point of the original Oregon Trail and the Sublette Cutoff. Access is by a primitive two-track trail. The site, located in the Little Sandy-Little Prospect Allotment, is seldom visited by tourists. There is very little development in the area; however, the two-track ruts still exist due to vehicle traffic. The historic setting of the area is rated as excellent *(Federal Register*, Volume 42, Number 21, page 6354).

TABLE 2-63 includes a list of the sites and trails potentially eligible for consideration on the National Register as determined by the State Historic Preservation Officer in June 1977 as well as the level of their significance and the condition of the site. MAP 2-32 shows historic trails and sites as well as the existing condition of the Oregon Trail. TABLE 2-64 includes the present condition of the above sites, as well as what factors presently affect them. Except for South Pass, the sites have not been fenced to protect the archeological values. Pacific Springs is fenced in Custodial Pasture 7.

VISUAL RESOURCES

Under the Bureau of Land Management's visual management classification system (BLM Manual 6300), the Sandy area has portions that are rated as Class II, III, IV, and V. A visual resource analysis and evaluation was conducted in 1976 by the Ogden, Utah landscape firm of Maas and Grassli. Under a contract with BLM, the firm identified and classified the area's visual resources in accordance with Manual 6300 guidelines. The complete report is available for review in the Rock Springs District Office.

Based on information provided by Maas and Grassli, the various classes were established for the landscape types and subtypes in each allotment (TABLE 2-65 and MAP 2-33 which is located at the end of this chapter). About 54% of the area, 1,070,039 acres, is classified as Class IV. Class IV landscapes may be modified to subordinate the existing character. About 698,792 acres, or 36%, is classified Class III. On Class III, modification can be evident but should be subordinate to the existing landscape character.

Class II covers 193,499 acres, or nearly 10%, and in this area modification should not be evident. Qualities of the existing landscape should be preserved here.

Class V is the smallest area and is an area where visual quality is below acceptable level. The visual quality of this area is due primarily to oil and gas development.

The objective management class establishes the maximum limits of change considered acceptable within an area. Contrast ratings, which break visual changes into their component parts, give a numerical index to change (APPENDIX 2K). Changes to the visual aspect of the landscape occur to three "features": the land itself, the vegetation on the land, or the addition of a structure to the landscape. Changes occur to these features through modification of their form, line, color, and/or texture, which are the landscape elements (TABLE 2-65).

TABLE 2-62

SITE OCCURRENCE WITHIN SAMPLE TYPES INSIDE THE STUDY AREA*

Unit Type	Number of Sites	Percent of Sample
Permanent Streams	65	40.6
Ephemeral Streams	25	15.6
Major Dune Fields	19	11.9
Minor Dune Areas	nd	nd
Flats	4	2.5
Uplands	10	6.3
Breaks and Buttes	22	13.8
Mountains	7	4.4
Springs	4	2.5
Playa Lakes	4	2.5
TOTAL	160	100.0

*Includes Sandy area and a portion of the BLM Rawlins District similar to the Sandy area.

nd-No data.

TABLE 2-63

SIGNIFICANT HISTORIC TRAILS AND SITES IN THE SANDY AREA

Trail or Site	Level of Significance	Date	Remains and Significance
Bridger Route of Oregon Trail	National	1841-1862	The original Oregon Trail which carried most of the emigrants in its early years. Later used as a stage road and route of Mormon migration.
Sublette Cutoff (Greenwoods Cutoff)	National	1844-1855	The bulk of the 49ers used this trail as it saved them several days.
Lander Cutoff	National	1858-1862	A major army transport road also used by emigrants.
Slate Creek Cutoff	State	1852-1870	A road from the Oregon Trail to the Sublette Cutoff which avoided the worst part of the Sublette Cutoff.
Kinney Cutoff	State	1857-1870	A road from the Oregon Trail to the Sublette Cutoff along the Green River.
Seminoe Cutoff	National	1844-1862	Developed to avoid numerous crossings of the Sweetwater River.
Point of Rocks-South Pass Stage Rd	Local	1870-1875	Used to move equipment and miners to the South Pass City gold mines.
Bryan-South Pass City Stage Road	State	1867-1879	The first road to the South Pass City gold rush.
Lander-Pinedale Stage Road	Local	1890-1920	A mail and freight road that was helpful in the settlement of the Sandy area.
Big Sandy Stage Station	State	1861-1862	Two stops on the Central Overland, California, and Pikes Peak Co. stage line, the first transcontinental stage route and an important communications link during the early stages of the Civil War. Both areas were important emigrant campsites. No surface remains are visible at either site (Haines 1973).
Dry Sandy Stage Station	Local		
Buckskin Crossing	State	1858-1962	A major campground and stream crossing on the Lander Cutoff. Trail ruts visible in the area.
Chicken Springs Stage Station	Local	1870-1875	A possible stage station on the Point of Rocks - South Pass City Stage Road, it was instrumental in the development of the South Pass gold rush. A foundation that possibly dates from the 1870's is on the site.
Freighter Spring	Local	1870-1875	A stage station on the Point of Rocks-South Pass City Stage Road, it was instrumental in the development of the South Pass Gold Rush. There are no structures remaining on the site.
McCann Ranch	Local	1900	A star route mail stop and an early ranch in the Sandy area.
Mormon Mail Station	State	1856-1857	One of a number of stations built to service a mail route between Missouri and Salt Lake City, and to supply westbound Mormons. It is also Burnt Ranch, the last crossing of the Sweetwater for emigrants, the south Pass Station for the Overland Stage Route, and a station on the Point of Rocks South Pass Stage Road.
Mormon Ferry and Mountain Mens Ferry	State	1849-1855	They were established to help emigrants on the Sublette Cutoff cross the Green River. No surface remains are visible.
Pacific Springs	State	1841-1910	This area has the longest historical occupation in the Sandy area, being used as an emigrant campsite, a stage and Pony Express stop, a relay station on the first transcontinental telegraph line, and an early ranch and general store. There are a ranch house, barn, and two sheds from the old ranch on the property.
Simpson's Hollow	National	1857	Wagons carrying supplies to the army advancing on Salt Lake City were burned here. This action prevented the army from reaching Salt Lake City (Haines 1973). Ultimately this delayed statehood for Utah. There are no visible remains at the site.

TABLE 2-64

CONDITION OF HISTORIC SITES IN THE SANDY AREA BY ALLOTMENT

		Factors Affecting Site*								
Allotment	Site	Construction	Trampling	Roads	ORV Damage	Fences	Campground	Erosion	Vandalism	Condition of Historic Setting
Bar X	South Pass	L								Good
Little Sandy-Little Prospect	Parting of the Ways									Excellent
Little Sandy-Little Prospect	Dry Sandy Stage Station		L					H	M	Good
Little Sandy-Little Prospect	McCann Ranch	M								Excellent
Steamboat Mountain	Freighter Spring		H					H		Poor
Little Colorado	Big Sandy Stage Station	H	H	H	L					Poor
Little Colorado	Mormon Ferry	M	M							Fair
Little Colorado	Mountain Men's Ferry	H	M	H						Poor
Little Colorado	Simpson's Hollow		L	M						Good
Continental Peak	Mormon Mail Station		M						M	Good
Pacific Creek	Pacific Springs	M	L			L				Excellent
Prospect Mountain	Buckskin Crossing	L	L			L	L			Excellent

* H - Site is 75% - 100% disturbed.
M - Site is 23% - 75% disturbed.
L - Site is 0% - 25% disturbed.

TABLE 2-65
EXISTING VISUAL CONTRAST RATINGS FOR SANDY LANDSCAPE TYPES BY ALLOTMENT

Contrast Ratings Existing Use			Land					Vegetation					Structures					
Allotment	Landscape Type	Management Class	Total	Form	Line	Color	Texture	Total	Form	Line	Color	Texture	Total	Form	Line	Color	Texture	Acres of Landscape Type
Bar X																		
	Continental Peak	III	0					0					5		1	1		807
		IV	0					0					5		1	1		1,059
	South Pass	II	0					0					8		2	1		2,230
		III	0					0					8		2	1		2,597
		IV	0					0					8		2	1		202
Total Acres																		(6,895)
Fish Creek																		
	South Pass	II	0					0					8		2	1		(7,237)
Gold Creek																		
	Wind River Front	II	0					0					5		1	1		19,582
	South Pass	II	0					0					8		2	1		10,943
Total Acres																		(30,525)
Little Sandy-Little Prospect																		
	Colorado-Sandy	III	7		2		1	10		2	2		10	1	1	1	1	35,301
		IV	7		2		1	10		2	2		10	1	1	1	1	65,429
	Prospect	IV	5		1	1		4		1		1	0					52,794
	Elk Mountain	IV	0					0					0					4,163
	Prospect Mountains	II	0					6		1	1	1	6		1	1	1	10,045
		III	0					6		1	1	1	6		1	1	1	1,601
	Wind River Front	II	0					0					5		1	1		14,785
		III	0					0					5		1	1		1,542
Total Acres																		(185,660)
Steamboat Mountain																		
	Red Desert	III	5		1	1		5		1	1		0					1,874
	Boars Tusk	III	6	1		1		1				1	7	1	1			2,798
	Jack Morrow	IV	0					5		1	1		12	1	2	1		18,742
	Rims	III	0					0					0					17,123
Total Acres																		(40,537)
Little Colorado-Green River																		
	Colorado-Sandy	IV	7		2		1	10		2	2		10	1	1	1	1	272,635
	Green River	II	0					0					5		1	1		25,754
	LaBarge	V	0					0					24	2	3	3	1	5,402
Total Acres																		(303,791)
Little Colorado-Farson																		
	Colorado-Sandy	III	7		2		1	10		2	2		10	1	1	1	1	34,406
		IV	7		2		1	10		2	2		10	1	1	1	1	170,717
Total Acres																		(205,123)
Little Colorado-Big Sandy																		
	Colorado-Sandy	III	7		2		1	10		2	2		10	1	1	1	1	40,013
		IV	7		2		1	10		2	2		10	1	1	1	1	157,370
	Sublettes Flat	III	7		2		1	8		2	1		8		2	1		11,930
		IV	7		2		1	8		2	1		8		2	1		8,729
Total Acres																		(218,042)
Red Desert																		
	Red Desert	III	5		1	1		5		1	1		0					205,423
	Honeycomb Buttes	II	0					0					0					9,735
	Red Desert Sand Dunes	III	11		2	2	1	11		2	2	1	0					17,159
	Pinnacles	III	0					3		1			0					1,069
	Continental Peak	IV	0					0					5		1	1		275
	Rims	III																11,714
Total Acres																		(245,375)
Bush Rim																		
	Red Desert	III	5		1	1		5		1	1		0					45,667
	Honeycomb Buttes	II	0					0					0					3,957
	Continental Peak	IV	0					0					5		1	1		529
	Jack Morrow	IV	0					5		1	1		12	1	2	1		38,956
	Rims	III																7,654
	Oregon Buttes	II																7,784
Total Acres																		(104,547)
Continental Peak																		
	Red Desert	III	5		1	1		5		1	1		0					588
	Honeycomb Buttes	II	0					0					0					13,354
	Colorado-Sandy	III	7		2		1	10		2	2		10	1	1	1	1	1,176
		IV	7		2		1	10		2	2		10	1	1	1	1	134
	Continental Peak	III	0					0					5		1	1		1,122
		IV	0					0					5		1	1		71,488
	Jack Morrow	IV	0					5		1	1		12	1	2	1		80
	South Pass	III	0					0					8		2	1		295
		IV	0					0					8		2	1		241
Total Acres																		(88,478)

TABLE 2-65 (Continued)
EXISTING VISUAL CONTRAST RATINGS FOR SANDY LANDSCAPE TYPES BY ALLOTMENT

Contrast Ratings Existing Use			Land					Vegetation					Structures					
Allotment	Landscape Type	Management Class	Total	Form	Line	Color	Texture	Total	Form	Line	Color	Texture	Total	Form	Line	Color	Texture	Acres of Landscape Type
Pacific Creek																		
	Colorado-Sandy	III	7		2		1	10		2	2		10		1	1	1	94,624
		IV	7		2		1	10		2	2		10	1	1	1	1	32,449
	Prospect	III	5		1	1		4		1		1	0					309
	Boars Tusk	III	6	1		1		1				1	7	1	1			4,486
	Boars Tusk Sand Dunes	III	0					0					0					619
	Continental Peak	IV	0					0					5		1	1		1,529
	Jack Morrow	III	0					5		1	1		12	1	2	1		387
		IV	0					5		1	1		12	1	2	1		66,481
	Oregon Buttes	II	0					0					0					812
	South Pass	III	0					0					8		2	1		1,005
		IV	0					0					8		2	1		155
Total Acres																		(202,856)
Sands																		
	Colorado-Sandy	II	7		2		1	10		2	2		10	1	1	1	1	457
		III	7		2		1	10		2	2		10	1	1	1	1	43,950
	Boars Tusk	II	6		1	1		1				1	7	1	1			4,083
		III	6		1	1		1				1	7	1	1			41,921
	Boars Tusk Sand Dunes	II	0					0					0					10,978
		III	0					0					0					13,463
Total Acres																		(114,852
White Acorn																		
	Colorado-Sandy	III	7		2		1	10		2	2		10	1	1	1	1	9,489
	Prospect	III	5		1	1		4		1		1	0					4,644
		IV	5		1	1		4		1		1	0					6,377
	Wind River Front	II	0					0					5		1	1		21,564
	South Pass	II	0					0					8		2	1		4,720
Total Acres																		(46,794)
Prospect Mountain																		
	Colorado-Sandy	III	7		2		1	10		2	2		10	1	1	1	1	361
		IV	7		2		1	10		2	2		10	1	1	1	1	12,058
	Prospect	III	5		1	1		4		1		1	0					14,092
		IV	5		1	1		4		1		1	0					21,967
	Elk Mountain	IV	0					0					0					2,135
	Prospect Mountain	II	0					6		1	1	1	6		1	1	1	4,478
	Wind River Front	II	0					0					5		1	1		6,912
		III	0					0					5		1	1		4,748
Total Acres																		(66,751)
Reservoir																		
	Colorado-Sandy	III	7		2		1	10		2	2		10	1	1	1	1	31,782
		IV	7		2		1	10		2	2		10	1	1	1	1	3,763
Total Acres																		(35,545)
Poston																		
	Colorado-Sandy	III	7		2		1	10		2	2		10	1	1	1	1	26,620
		IV	7		2		1	10		2	2		10	1	1	1	1	23,091
	Prospect	III	5		1	1		4		1		1	0					924
Total Acres																		(50,635)
Pine Creek																		
	South Pass	II	0					0										(14,089)
TOTAL ALLOTMENT ACRES*																		1,967,732*

* Does not include custodial pastures, no grazing area and withdrawals.

The acceptable contrast rating (BLM Manual 6320.11) for each visual class is:

1. Class II—The degree of contrast for any one element should not exceed 2 (moderate), and a total contrast rating for any feature may not exceed 10.
2. Class III—The degree of contrast for any one element should not exceed 2, and the total rating for any feature should not exceed 16.
3. Class IV—The total contrast rating for any feature should not exceed 20.
4. Class V—This is an interim classification for rehabilitation or enhancement. The rating is based on its potential for Class II, III, or IV.

The Sandy area has been divided into eight landscape types (TABLE 2-66 and MAP 2-34 located at the end of this chapter). The landscape types are visually similar and have a similar visual contrast for a given activity. Landscape subtypes are areas which vary enough from typical to be considered separately. A brief description of the landscapes and their key characteristics are as follows:

Red Desert Landscape Type

The Red Desert Landscape (FIGURE 2-42) is generally flat to gently rolling and horizontal in aspect. The landscape is defined by rims. There are no significant water features. The soil is light brown to grey in color. The vegetation in the Red Desert is sagebrush with some grass that varies from clumpy to uniform coverage. The vegetation is subdued grey to brown and finely textured. The most common structures are unpaved minor roads and vehicle trails which are obscured from the normal eye level in a pickup truck through foreshortening of vegetation.

Honeycomb Buttes

The Honeycomb Buttes in the northern section of the Red Desert Landscape are badland formations. They are rounded to flat-topped vertical features with horizontal bands of contrasting red and grey strata. The setting for these features is similar to the Red Desert Landscape, but vegetation is sparse or lacking in many areas in and around the buttes themselves. The appearance of wildlife near the buttes is not infrequent and imparts a sense of scale to the features.

Red Desert Sand Dunes

The Red Desert Sand Dunes are part of a major sand dune complex. In this portion of the complex the dunes are stabilized by grass and sage. The soil is lighter in color than elsewhere in the Red Desert Landscape and the topography is slightly more accentuated. Roads and trails in this area are more visible for this reason.

The Pinnacles

These features on the west edge of the Red Desert Landscape are similar to the Honeycomb Buttes except that the strata are less distinct and less brilliantly colored. The Pinnacles are also more uniform, connected, and flat-topped than the Honeycomb Buttes.

Classification

The Red Desert is a Class III landscape and represents 253,552 acres of the Sandy area. The Honeycomb Buttes are rated Class II and represent 27,046 acres. The sand dunes in the Red Desert and the Pinnacles are rated Class III. The sand dunes cover 17,159 acres, and the Pinnacles represent 1,069 acres in the Sandy area.

Colorado-Sandy Landscape

The Colorado-Sandy Landscape (FIGURE 2-43) is gently rolling with infrequent and indistinct drainages that are below the normal view though these drainages are often deep and have steep banks. The soil is fine in texture and brown to light brown in color. The vegetation is low, grey, and finely textured. Sagebrush is uniformly distributed over the area with intermittent occurrences of lower growing half-shrubs. Structures in the Colorado-Sandy landscape include gas wells, oil wells, reservoirs, stock tanks, and roads.

Green River Vicinity

The area close to the Green River, including Fontenelle Reservoir, has areas of fairly dense vegetation including cottonwoods and willows in large clumps or in lineal stretches on the banks of the Green River. In some areas the banks of the Green River and the slopes of associated canyons are steep. Few signs of man's activity are apparent with the exception of the Fontenelle Dam and a few roads.

LaBarge Vicinity

The LaBarge area is similar to the Green River area except that oil and gas development has had a profound effect upon the appearance of the landscape. Many structures such as aluminum buildings and pumping rigs mark the landscape. Roads and bare areas related to drill pads are very evident in this area.

Sublettes Flat

Sublettes Flat is similar to the Colorado-Sandy Landscape except that this area is very flat and vegetation is generally lower and in irregular splotches.

TABLE 2-66

ACRES OF VISUAL CLASSES IN THE SANDY AREA BY LANDSCAPE TYPE IN EACH ALLOTMENT

LANDSCAPE TYPE / ALLOTMENT	VISUAL CLASS	Red Desert	Honeycomb Buttes	Red Desert Sand Dunes	Pinnacles	Colorado/ Sandy	Green River Vic.	La Barge Vic.	Sublettes Flat	Prospect	Elk Mtn
Bar X	II										
	III										
	IV										
	Totals										
Fish Creek	II										
Gold Creek	II										
Little Sandy-Little Prospect	II										
	III					35,301					
	IV					65,429				52,794	4,163
	Totals					100,730				52,794	4,163
Steamboat Mountain	III	1,874									
	IV										
	Totals	1,874									
Little Colorado: Green River	II						25,754				
	IV					272,635					
	V							5,402			
	Totals					272,635	25,754	5,402			
Farson	III					34,406					
	IV					170,717					
	Totals					205,123					
Big Sandy	III					40,013			11,930		
	IV					157,370			8,729		
	Totals					197,383			20,659		
Red Desert	II		9,735								
	III	205,423		17,159	1,069						
	IV										
	Totals	205,423	9,735	17,159	1,069						
Bush Rim	II		3,957								
	III	45,667									
	IV										
	Totals	45,667	3,957								
Continental Peak	II		13,354								
	III	588				1,176					
	IV					134					
	Totals	588	13,354			1,310					
Pacific Creek	II										
	III					94,624				309	
	IV					32,449					
	Totals					127,073				309	
Sands	II					457					
	III					43,950					
	Totals					44,407					
White Acorn	II										
	III					9,489				4,644	
	IV									6,377	
	Totals					9,489				11,021	
Prospect Mountain	II										
	III					361				14,092	
	IV					12,058				21,967	2,135
	Totals					12,419				36,059	2,135
Reservoir	III					31,782					
	IV					3,763					
	Totals					35,545					
Poston	III					26,620				924	
	IV					23,091					
	Totals					49,711				924	
Pine Creek											
TOTALS	II		27,046			457	25,754				
	III	253,552		17,159	1,069	317,722			11,930	19,969	
	IV					737,646			8,729	81,138	6,298
	V							5,402			
	TOTALS	253,552	27,046	17,159	1,069	1,055,825	25,754	5,402	20,659	101,107	6,298

TABLE 2-66 (Continued)

ACRES OF VISUAL CLASSES IN THE SANDY AREA BY LANDSCAPE TYPE IN EACH ALLOTMENT

LANDSCAPE TYPE / ALLOTMENT	VISUAL CLASS	Prospect Mtns.	Boars Tusk	Boars Tusk Sand Dunes	Continental Peak	Jack Morrow	Rims	Oregon Buttes	Wind River Front	South Pass	TOTALS FOR ALLOTMENT
Bar X	II									2,230	2,230
	III				807					2,597	3,404
	IV				1,059					202	1,261
	Totals				1,866					5,029	6,895
Fish Creek	II									7,237	7,237
Gold Creek	II								19,582	10,943	30,525
Little Sandy-Little Prospect	II	10,045							14,785		24,830
	III	1,601							1,542		38,444
	IV										122,386
	Totals	11,646							16,327		185,660
Steamboat Mountain	III		2,798				17,123				21,795
	IV					18,742					18,742
	Totals		2,798			18,742	17,123				40,537
Little Colorado-Green River	II										25,754
	IV										272,635
	V										5,402
	Totals										303,791
Farson	III										34,406
	IV										170,717
	Totals										205,123
Big Sandy	III										51,943
	IV										166,099
	Totals										218,042
Red Desert	II										9,735
	III						11,714				235,365
	IV				275						275
	Totals				275		11,714				245,375
Bush Rim	II							7,784			11,741
	III						7,654				53,321
	IV				529	38,956					39,485
	Totals				529	38,956	7,654	7,784			104,547
Continental Peak	II										13,354
	III				1,122					295	3,181
	IV				71,488	80				241	71,943
	Totals				72,610	80				536	88,478
Pacific Creek	II							812			812
	III		4,486	619		387				1,005	101,430
	IV				1,529	66,481				155	100,614
	Totals		4,486	619	1,529	66,868		812		10,160	202,856
Sands	II		4,083	10,978							15,518
	III		41,921	13,463							99,334
	Totals		46,004	24,441							114,852
White Acorn	II								21,564	4,720	26,284
	III										14,133
	IV										6,377
	Totals								21,564	4,720	46,794
Prospect Mountain	II	4,478							6,912		11,390
	III								4,748		19,201
	IV										36,160
	Totals										66,751
Reservoir	III										31,782
	IV										3,763
	Totals										35,545
Poston	III										27,544
	IV										23,091
	Totals										50,635
Pine Creek	II									14,089	14,089
TOTALS	II	14,523	4,083	10,978				8,596	62,843	39,219	193,499
	III	1,601	49,205	14,082	1,929	387			6,290	3,897	698,792
	IV				74,880	124,259	36,491			598	1,070,039
	V										5,402
	TOTALS	16,124	53,288	25,060	76,809	124,646	36,491	8,596	69,133	43,714	1,967,732

FIGURE 2-42 RED DESERT LANDSCAPE. This view includes part of the Honeycomb Buttes in the northern portion of the Red Desert.

Classification

The Colorado-Sandy Landscape is primarily Class IV (737,646 acres of the Sandy area) with Class III areas amounting to 317,722 acres adjacent to major roads. It also includes 457 acres of Class II area related to, but outside of, the Boars Tusk/Sand Dunes Area. The Green River vicinity, consisting of 25,754 acres, is Class II. The LaBarge vicinity consists of 5,402 acres of Class V landscape. Sublettes Flat includes 8,729 acres of Class IV and 11,930 acres of Class III landscape.

Prospect Landscape Type

The Prospect Landscape (FIGURE 2-44) is bounded by Elk Mountain to the west and by the Prospect Mountains and the Continental Divide to the east. This landscape type is similar to the Colorado-Sandy Landscape except that the landform is more broken and undulating, and rocky outcrops are common, especially near the Prospect Mountains.

Elk Mountain

Elk Mountain is flat-topped, marked vertically by drainages and horizontally by indistinct white bands of soil. Vegetation patterns follow the vertical drainages. Structures are not evident.

Prospect Mountains

The topography of the Prospect Mountains is more severe than the Prospect Landscape and includes hummocks and large rock outcrops. Ridges and hilltops are irregular in outline. Vegetation includes green aspen groves with crisp edges and scattered dark green pines which contrast with large areas of sage. Roads appear in this area only intermittently and are concealed by the variation in topography. The presence of other structures is not evident.

Classification

The Prospect Landscape consists of 19,969 acres of Class II, 42,746 acres of Class III and 81,138 acres of Class IV. Elk Mountain, consisting of 6,298 acres, is Class IV. The Prospect Mountains include 14,523 acres of Class II and 1,601 acres of Class III landscape.

Boars Tusk Landscape Type

This landscape type (FIGURE 2-1) is gently rolling to flat sage land with a central feature (Boars Tusk), a black volcanic neck of coarse texture. This feature contrasts with gently undulating white sand dunes to the north. The sagebrush and grass vegetation is low and patchy with much exposed earth. The soil is fine and tends to form dust clouds with wind and soil disturbance such as the movement of vehicles on dirt roads. Structures include a railroad line and power poles. Oil and gas development has disturbed parts of the area. Development has had little visual effect.

Active Sand Dunes

The sand dunes themselves are white to light beige with some patches of grey to light brown vegetation. Vegetation is generally absent. Textural variations are subtle and caused by wind patterns over the surface of the sand. Line is smooth and undulating.

Classification

Boars Tusk is comprised of 4,083 acres of Class II and 49,205 acres of Class III. The Sand Dunes include 10,978 acres of Class II and 14,082 acres of Class III landscape.

Continental Peak Landscape Type

This landscape type (FIGURE 2-45) is primarily grassland with small patches of sage on hillsides. The topography is rolling with broad canyons. The soil is light brown and does not contrast very much with the vegetation, which is golden brown. The edges of hills are crisp and well defined. There is little development that is evident. Roads tend to blend easily into the landscape. The continental Peak Landscape consists of 1,929 acres of Class III and 74,880 acres of Class IV landscapes.

Jack Morrow Landscape Type

The Jack Morrow Landscape (FIGURE 2-46) is made up of steep, flat-topped ridges, typically with shale strata near the top which give them a crisp line when seen against the sky. Canyons are deep and rounded near the base of slopes. Vegetation is largely sagebrush-grass with lush green grass near stream bottoms and aspen in some of the intermittent drainages. Ridge tops are sparsely vegetated with sagebrush. Some areas are marked by scattered stands of dark green evergreen trees. Roads, power poles and lines, and oil and gas structures are present but are obscured because of topographic variations.

Rims

The eastern portion of the Jack Morrow Hills includes rims that are particularly steep. Many dramatic views are present from the tops of the rims into broad canyons and into the Red Desert. Fewer roads and developments are present in this part of the Jack Morrow Hills because the steepness of the rims limits vehicle access to the slopes.

FIGURE 2-43 COLORADO-SANDY LANDSCAPE. This view is typical of this landscape.

FIGURE 2-44 PROSPECT LANDSCAPE. Tabernacle Butte and Elk Mountain are shown in this photograph.

FIGURE 2-45 CONTINENTAL PEAK LANDSCAPE. Most of the Continental Peak Landscape is undulating grassland.

FIGURE 2-46 JACK MORROW LANDSCAPE. The Jack Morrow Landscape consists of steep rims and deep canyons.

Oregon Buttes

The Oregon Buttes is a massive vertical feature and a landmark in the area. It is irregular in form with near vertical sides and a flat top. Shadow patterns on the buttes are vertical. Except for dark green trees on and near the top, the feature is grey. Little human use is evident.

Classification

The Jack Morrow Hills Landscape includes 387 acres of Class III and 124,259 acres of Class IV landscape. The rims include 36,491 acres of Class III landscape and the Oregon Buttes include 8,596 acres of Class II landscape.

Wind River Front Landscape

The Wind River Front (FIGURE 2-47) is a variable landscape with many water features and varied types of woodland. The landform of the Wind River Front is gently to steeply rolling with numerous rock outcrops and areas with scattered clumps of trees gradually forming distinct forested areas fringed with aspen. Meadow areas are green and grassy, and bottom areas are lined with dense to moderately dense willow growth. Structures in the landscape include ranch houses, fences, roads, and power poles. Most of the structures appear fitting and part of the fabric of the characteristic landscape. The Wind River Front is primarily Class II (62,843 acres) with 6,290 acres of Class III landscape.

South Pass Landscape Type

The South Pass Landscape (FIGURE 2-48) is very similar to the Wind River Front Landscape, but human activity is more pronounced and more evident. It has 39,219 acres of Class II landscape, 3,897 acres of Class III, and 598 acres of Class IV.

NATURAL LANDMARKS

A complete inventory of natural landmarks and natural history areas has not taken place in the Sandy area and none has been formally designated. Several potential natural landmarks, however, have been identified by the National Park Service. These include the previously described Boars Tusk/Sand Dunes area in the Sands Allotment as well as Steamboat Mountain in the Steamboat Mountain Allotment, and Continental Peak in the Continental Peak Allotment.

The Visual Resource Management System places a high value upon the natural character of the land, and it is the best measure of change to the existing natural state of these natural features. The existing "naturalness"of these landmarks cannot be determined because of the influence of livestock grazing over the years. Return to a natural state through elimination of source current uses is a prerequisite to proper management of these areas once if designated, but use by grazing animals is a natural part of these landscapes. The difference in the "naturalness"of grazing by sheep, cattle and horses versus the grazing by buffalo, antelope, and deer is a debatable issue that cannot be resolved in this document.

RECREATION RESOURCES

Most of the recreation use in the Sandy area is concentrated near streams and reservoirs (MAP 2-35), included in Volume 3 of the FES. Most of this use takes place at Fontenelle Reservoir and Big Sandy Reservoir, in the foothills of the Wind River Range, and along the Big Sandy River and Little Sandy Creek. Activity near the Wind River Range (in an area known locally as the Wind River Front) and in the South Pass area is largely oriented toward the Sweetwater River and the many creeks in the area. In response to the high volume of use, nine campsites have been established. Eight of these campsites are undeveloped; all of the sites through observation are considered overused.

An estimated 67% of the visitor use in the Sandy area is related to water features and water-related settings and habitats representing less than 11% of the area. An estimated 99,372 visitor days per year are spent in these areas.

The estimated primary uses in these areas are camping, fishing, bird and big game hunting, floatboating, picnicking, and sightseeing (TABLE 2-67). Secondary uses in the Wind River Front and South Pass area are various winter sports including snow play, snowmobile use, and cross-country skiing. Additional uses of Fontenelle Reservoir and Big Sandy Reservoir are boating and waterskiing.

Concentrations of nonwater-related use are identifiable near the Farson Fish Beds, near Oregon Buttes and Continental Peak, and in the Sands area. The primary activities in the Farson Fish Beds area and Oregon Buttes-Continental Peak area are rock and mineral collecting, camping, and sightseeing. Sightseeing and recreation vehicle use are the major activities in the Sands area.

The highest density use in the Sandy area occurs within a small area near Boars Tusk where a sand dune recreation vehicle rally is held each year. In an area of less than one square mile, 3,863 visits by actual count, amounting to 3,700 visitor days, occur on the Fourth of July weekend (TABLE 2-67).

The use of these areas, excluding the rally, is moderate. Use amounts to 4,550 visitor days per year, or about 3% of the total estimated visitor use for the Sandy area. Use density is less than one visitor day per acre per year.

Highway 187 and Highway 28 carry a large volume of recreation traffic and a large number of sightseers. Highway 187 is a major conduit for tourists travelling to Yellowstone and Grand Teton National Parks. Visitor use along these thoroughfares amounts to about 4,000 visitor days.

Most of the Sandy area is used very little for recreation; however, hunting, collecting, recreation vehicle

FIGURE 2-47 WIND RIVER FRONT LANDSCAPE
The Wind River Front is at the foot of the west slope of the Wind River Mountain Range.

FIGURE 2-48 SOUTH PASS LANDSCAPE. The Sou Pass Landscape is a much travelled area.

TABLE 2-67

ESTIMATED VISITOR USE BY ACTIVITY BY ALLOTMENT IN VISITOR DAYS

	Bar X	Fish Creek	Gold Creek	Little Sndy/ Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Total Visitor Days by Activity
Recreation Vehicle Use - Sand Dune Rally (1)											3,700						3,700
Recreation Vehicle Use (2, 3)			360	803	278		805	68	35	233	248	315	713			15	3,873
Camping-Undeveloped Sites* (4)			1,200			5,834						100	700	7,875		100	15,809
Camping Other Areas (2, 3, 5)	777	74	15,404	8,485	29	2,337		440	637	604		10,782	6,584	1,093	602	58	47,906
Picnic - Undeveloped Sites*(3,5)			544			66			30		67	45	337	51		45	1,185
Picnic - Other Areas* (3)	80	20	450	600								280		100		20	1,550
BIG GAME HUNTING																	
Antelope (6)	3	5	4	11	12	82	236	28	46	13	21	3	2	3	6	1	476
Deer (6)	2	3	60	132	33	202	10	62	9	19	17	79	191	6	74	4	903
Elk (6)	1	20	438	39	20			37		12	7	90	167	4	41	30	906
Moose (6)	1	1	1						1			1	3	2	2		12
Upland Game Hunting Blue & Ruffled Grouse (7)			8	2					46			6	6				68
Mourning Dove (7)			5		12					41	32			4	2	2	98
Cottontail Rabbit (7)						176					131						307
Sage Grouse (2, 3)	29	22	511	2,529	48			95		324		1,218	600			4	5,380
Ducks and Geese (7)						328								47			375
Collecting	355			412	14	350		225	273	231				48			1,908
Fishing - Stream (2, 3)	30	34	5,695	3,590					43			3,987	2,628	825	500	34	17,366
Floatboating	117	33	217	173		1,033			17			150	300	200	217		2,457
Fishing - Reservoir						6,911								758			7,669
Boating						1,100								248			1,348
Waterskiing (5)						62								102			164
Swimming (5)						132								8			140
WINTER SPORTS																	
Snowplay (3)	56	56	222									28				139	501
Cross-Country Skiing (3)			103	2								20					125
Snowmobiling (3)			117			39					411	221					788
Sightseeing - Highway (8)	60		180	210		946				752	705	180		598	230	120	3,981
Sightseeing - General (2, 3, 5)	85	47	1,612	4,477	771	688	549	419	395	100	2,000	3,196	4,623	10,186		22	29,170
TOTALS	1,596	315	27,131	21,465	1,217	20,286	1,600	1,374	1,532	2,329	7,339	20,701	16,854	22,158	1,674	594	148,165

* Includes one partially developed site in Wind River Front and site on Bureau of Reclamation land at Fontenelle Reservoir.

1. Based on actual count - Jack Morrow URA, BLM 1975.
2. Based on traffic counts and interviews - Jack Morrow URA, BLM 1975.
3. Based on staff estimate.
4. Based on staff estimate - Jack Morrow URA, BLM 1975.
4. Based on 1975 Bureau of Reclamation data.
6. Based on State of Wyoming Game and Fish "Annual Report of Upland Game Harvest," 1975 and Ecology Consultants, Inc. "Species List of the Sandy Area," 1976.
7. Based on 1975 State of Wyoming Game and Fish "Annual Report of Upland Game Harvest."
8. Based 1973 Wyoming Department of Highways traffic data included in Jack Morrow URA, BLM 1975.

use, and sightseeing do occur throughout the area. The average density of use is very low, amounting to a little more than 0.07 visitor days per acre per year. Visitor use density is particularly low in the Little Colorado, Red Desert, and Pacific Creek Allotments where access is poor. Distribution of use by density is shown on TABLE 2-68 for areas designated on MAP 2-35.

The lack of use in these areas is a recreation value in itself. Comment at public meetings has implied concern for wide, open spaces, especially those of the Red Desert. A common sentiment of people in Wyoming expresses the value of areas where an individual can get completely away from other people. It cannot be construed that this desire also implies a desire for an individual to remove himself from all evidence of human work.

The overall importance of the recreation value of the Sandy area is considered secondary in regional and local importance to the Bridger-Teton National Forest and to the Flaming Gorge Recreation Area. Pressure for recreation opportunity is extremely heavy in the Wind River Front. Even so, during seasonal peaks in late July and in August, overuse has been observed in the Sandy area on most weekends during this period by BLM personnel.

Much of the Sandy area is accessible only by using rough, unmaintained roads; therefore, recreation opportunity is limited by access. A four-wheel drive vehicle is a prudent choice, if not a necessity, particularly for hunters, fishermen, and mineral collectors. Recreation vehicles with four-wheel drive are an important means of transportation, as well as a form of recreation because of the condition of the roads and trails.

The Sandy area is either more appropriate or more convenient than nearby areas for activities such as collecting, antelope hunting, sage grouse hunting, and sand dune recreation vehicle use.

Each year the Wyoming Game and Fish Department provides hunting seasons for pronghorn antelope, mule deer, elk, and moose in the Sandy area. Using the harvests for the 1973, 1974, and 1975 seasons, the average annual harvest is 616 antelope, 437 deer, 708 elk, and 89 moose in the hunt areas that include portions of the Sandy area (Wyoming Game and Fish Department 1974, 1975a, and 1976 and MAP 2-21).

Conflicts exist between recreation activities and existing nonrecreation uses. Camping, fishing, and picnicking are carried out primarily on bottom lands (staff observation) and compete with livestock. Concentrations of livestock detract from the recreation experience by their physical presence, by trampling that limits the number of good campsites, and by leaving fecal matter that is undesirable because of the smell and potentially, at least, a health hazard. Trampling and the presence of cattle feces is a common complaint of recreationists (BLM 1975).

Floatboating is difficult because of existing fence crossings on rivers and creeks which can damage rubber rafts, inner tubes, and the floatboaters as they pass the barbed wire. At the present time fences cross the Big Sandy River in seven places, the Sweetwater River in nine places, and the Little Sandy Creek in at least thirteen places.

Fences in the area could also pose a hazard to cross-country skiers and snowmobile users, although no known accidents have occurred. Fences are occasionally obscured by snow.

Wilderness Values

The wilderness inventory, in accordance with Sec. 603 (a) of the Federal Land Policy and Management Act (FLPMA), has not been completed on the national resource lands that would be impacted by the proposal. Prior to implementation of any actions, the areas will have to be inventoried and impacts on potential or existing wilderness areas assessed.

Until Congress acts on an area that has been designated for wilderness study, existing multiple-use activities, including grazing and supporting activities, will continue. New uses or expanded existing uses will be allowed if the impacts will not impair the suitability of the area for wilderness.

The wilderness study will be coordinated with other Federal agencies including the U.S. Forest Service. Areas adjacent to the Bridger-Teton and Shoshone National Forests will be considered with aspect to Forest Service Rare II study areas.

In the Sandy area, two areas have been identified by staff members as having wilderness qualities: the sand dune complex to the north of Boars Tusk and the Honeycomb Buttes-Oregon Buttes area along the north edge of the Red Desert. The entire Red Desert within the Sandy area is also considered as having potential wilderness value.

The sand dune area covers approximately 25,060 acres, primarily in the Sands Allotment (24,441 acres) and partly in the Pacific Creek Allotment (619 acres). Part of this area may have potential as a wilderness or natural area because of the interest people have in the active sand dunes, the perennial ice found buried in the dunes, and the elk herd which resides in this area.

The Honeycomb Buttes-Oregon Buttes area is dissected by one road. This area contains 35,642 acres, including 27,046 acres of badlands which are interesting scenery and are the home of a herd of wild horses. The Oregon Buttes (8,596 acres) is a natural feature of interest because of its dominance of the surrounding area, its geologic significance, and its presence of petrified wood. Parts of the Honeycomb Buttes-Oregon Buttes area are in the Red Desert (9,735 acres). Bush Rim (11,740 acres), Continental Peak (13,354 acres), and Pacific Creek (812 acres) Allotments.

The Red Desert includes the Honeycomb Buttes-Oregon Buttes area; a smaller area of badlands called The Pinnacles (1,069 acres); an inactive portion of the sand dune complex (17,159 acres), of which the Boars Tusk/Sand Dunes are a part; and broad areas of relatively flat sageland (253,553 acres). It totals 289,194 acres, or about 15% of the total Sandy area. The Red Desert has been publicized nationally as an area of environmental concern. Portions of the Steamboat Mountain (1,874 acres), Red Desert (215,158 acres), Bush Rim (57,407

TABLE 2-68

ESTIMATED VISITOR USE DENSITY BY RECREATION AREA

Recreation Area	Approximate Use Density Visitor Use/Section	No. of Sections	Estimated Visitor Days	% of Total Area	Estimated Visitor Days (Nearest %)
*Fontenelle Dam	3,911	2	7,821	0.06	5
*Upper Big Sandy River	739	6	4,434	0.19	3
Dune Rally Site	636	6	3,818	0.19	3
*Wind River Front	574	94	53,945	2.97	36
*Fontenelle Reservoir	519	14	7,263	0.44	5
*Elkhorn Junction	388	6	2,327	0.19	1
*Big Sandy Reservoir	339	14	4,744	0.44	3
*Lower Wind River Front/South Pass	134	75	10,084	2.38	7
*Creeks, Rivers, and North Portion of Sandy**	100	72	7,178	2.27	5
Big Sandy River	121	40	4,853		
Upper Little Sandy Creek	71	8	570		
Little Sandy Creek	73	24	1,755		
Farson Fish Beds	74	16	1,182	0.51	1
Highways	48	85	4,096	2.69	3
187 South of Farson	90	13	1,164		
187 North of Farson	48	34	1,624		
28 East of Farson	34	38	1,308		
Sands	56	35	1,948	1.10	1
Oregon Buttes/ Continental Peak	48	27	1,302	0.85	1
*Southern Portions of Rivers, Creeks	25	62	1,576	1.96	1
Lower Green River	35	19	668		
Lower Big Sandy	19	29	577		
Upper Green River	24	14	331		
Remaining Area	13.65	2,651	36,191	83.76	25
TOTALS		3,165	147,960	100.00	100

* Visitor use related to water, water-related activity, and water-related habitats.

** Does not include Elkhorn Junction, Upper Big Sandy, Wind River Front, and Upper Green River.

acres), Continental Peak (13,942 acres), and Pacific Creek (812 acres) are included in this area.

Areas with wilderness potential total 314,250 acres, or approximately 16% of the Sandy area. These areas will receive more consideration through the wilderness program. Through this program, other areas may be identified. It is unlikely that all areas with wilderness potential have been identified or that the entire area cited here has wilderness potential.

LIVESTOCK GRAZING

The predominant agricultural land use in the Sandy area is range livestock production. The licensees utilize national resource lands, national forests, State, and private lands in their yearlong operation (TABLE 2-69).

Basically, the Sandy area today is utilized as spring, summer, and fall range with the licensees supporting their stock on private lands or checkerboard lands during the winter. TABLES 2-69 and 2-70 show use on the Sandy area.

Typically, cattle enter the Sandy area in the spring, remain through the summer, and are removed in the fall. Sheep enter the Sandy area in the spring. The majority leave for the national forests in the summer, then return in the fall prior to moving to the winter range. However, there are some herds that stay on NRL during the entire summer.

The licensees operate typical cow-calf and sheep operations. The cows are bred to calve either on the NRL or on private lands between February and May. Calves are weaned and sold in the fall when they are removed from the NRL. The ewes are bred to lamb primarily in May. The lambs also are weaned and sold in the fall.

Although 58% of the licensees currently graze at least some cattle, the cattle utilize only 26% of the licensed AUMs in the Sandy area. In 1974-75 there were 60,179 AUMs, 47% of the available AUMs, licensed as regular nonuse (TABLE 2-70). The major portion of this was by sheep operators wanting to convert to cattle. Based in part on TABLE 2-70, licensed regular nonuse has averaged 40% for the last six years (1971-1975).

Currently wildlife utilizes 28,348 AUMs of forage (TABLE 2-24); wild horses utilize 21,015 AUMs (TABLE 2-24); and actual livestock use is 86,105 AUMs (TABLE 2-70). The 1964-65 range survey for the area indicated a proper livestock grazing capacity of 127,928 cattle AUMs (TABLE 2-26). The methodology used to determine grazing capacity is shown in APPENDIX 2I.

Existing projects are shown on MAPS 2-4 and 1-5. Those projects on NRL were developed either exclusively by the BLM, by cooperative agreement with the licensee, or by the licensee with a permit issued under Section 4 of the Taylor Grazing Act. The majority of existing water developments are located in allotments with significant summer livestock use. There are not as many water developments in the allotments used primarily for spring and fall grazing. Licensees rely on snow for their sheep to eat or trail the herds to the well developments.

A brief description of the grazing use made in each allotment with the livestock numbers mentioned taken from the 1975 grazing licenses follows. Wherever there are cattle grazing in an unfenced allotment, there are trespass cattle in the adjacent allotment at some time. A certain amount of drift is accepted as inevitable; however, when groups of cattle are allowed to remain for extended periods it becomes a trespass problem.

Bar X Allotment

Implemented in 1969, the original Bar X AMP was designed for sheep use, utilizing a two-pasture rest-rotation grazing system. The individual operator converted to both sheep and cattle in the early 1970's and presently turns 193 cattle, 3 horses, and 80 sheep into this allotment about June 1. The stock remain here until moved to winter range about October 15.

Fish Creek Allotment

Implemented in 1972, the original Fish Creek AMP was designed for cattle, utilizing a two-pasture deferred grazing system. Presently, the individual operator puts 300 cattle on the NRL about May 16 in accordance with the AMP. He moves them onto his meadows along the Sweetwater River about August 15, where they remain until he trails them back to his base property in the fall.

Gold Creek Allotment

Written in 1973, the original Gold Creek AMP is not yet fully implemented. Presently two licensees turn 768 cattle out to graze on NRL June 1 or later. One licensee grazes 150 cattle, while the other grazes 618 cattle. The 150 head of cattle are on the adjacent Bridger-Teton National Forest from mid-August to mid-September. These cattle then come back onto the allotment. They are trucked to base properties by October 31. This allotment is currently operated as two allotments without a fence between them.

Little Sandy Allotment

The licensees turn out 1,660 cattle to graze on NRL May 1. One of these licensees is a grazing association with approximately 1,600 cattle, the majority of which are trucked to the allotment. The rest of these cattle and the other two operators' cattle are trailed to the allotment. The association puts its cattle in individual use pastures from approximately mid-August to mid-September. All cattle are removed to base properties by October 31.

TABLE 2-69

SANDY AREA LICENSEES AND PERCENT OF OPERATIONS
DEPENDENT ON SANDY AREA NATIONAL RESOURCE LANDS

Licensees	% NRL	% Other[1/]	Remarks
1. Bar X Sheep Company	18	82	Substantial Nonuse
2. Samuel O. Bennion			Total Nonuse
3. Big Sandy & Green River Livestock Company	16	84	
4. Blair & Hay Land & Livestock Co.	57	43	Substantial Nonuse
5. Warren J. Burke	28	72	
6. Carricaburu-Jaurequi Livestock Company	13	87	
7. Rudolph Chesnovar	44	56	
8. Chilton Land & Livestock Co.	56	44	Substantial Nonuse
9. Stanford Cowley	32	68	
10. Margaret Davidson			Total Nonuse
11. Dearth-Jamieson Sheep Co.	45	55	Substantial Nonuse
12. Burton & Ralph DeLambert	51	49	
13. Robert B. Eaton	49	51	
14. William M. Edwards	5	95	
15. Erramouspe Brothers			Total Nonuse
16. Mrs. Matt Failoni			Total Nonuse
17. Fear Ranches, Inc.	31	69	Substantial Nonuse
18. William & Pauline Frank	30	70	
19. G&E Livestock Company	43	57	
20. Leland Grandy	51	49	
21. Grey's River Livestock Company	34	66	
22. Rudolph Gunter			Total Nonuse
23. Leonard W. Hay			Total Nonuse
24. Alvin Hatch	13	87	
25. Aaron Jones	50	50	
26. Aaron & Barbara Jones	5	95	
27. Julian Land & Livestock Co.	21	79	
28. Lazy K Ranch	40	60	
29. Little Sandy Grazing Association	38	62	
30. Robert Lozier			Total Nonuse
31. Magagna Brothers	42	58	
32. Mau Livestock Company	14	86	
33. Frank C. Mayo	28	72	
34. Midland-Dunton Sheep Company	21	79	
35. Vernon Mrak			Total Nonuse
36. Orson Nate			Total Nonuse
37. Nelson Land & Livestock Company			Total Nonuse
38. Andrew Pal	50	50	
39. Roger Peart	17	83	
40. John T. Radosevich	18	82	
41. Ellen Richie & Sons	42	58	
42. Riverside Livestock Company	40	60	
43. L. W. Roberts	24	76	
44. Noall Z. Tanner	44	56	
45. William J. Thoman	23	77	
46. Thompson Land & Livestock Company	17	83	
47. White Acorn Sheep Company	37	63	
48. Willowbrook Ranch	35	65	
49. Yose Cattle Company	21	79	
AVERAGE	32	68	

1/ Other includes national resource land not in Sandy area, national forest, State, and private lands.

TABLE 2-70

ACREAGE AND USE OF EXISTING ALLOTMENTS
USING 1974-1975 GRAZING LICENSES

Allotment	Number of Licensees Reg	Trail	Grazing Acreage 1/ Federal	State	Private	NRL	Average Use AUMs 2/ Actual Other	Total	Nonuse NRL	Nonuse Other	Total	Total Base Prpty. Qual. 5/	Remarks
1. Bar X	1	0	3,747	1,140	2,008	463	482	945	5	5	10	468	Converted Cattle
2. Fish Creek	1	0	6,517	300	420	583	206	789	83	28	111	666	
3. Gold Creek	1	2	24,745	2,660	3,120	2,369	700	3,069	0	0	0	2,369	Converted Cattle
3a. Willow Creek	1	0	3/	3/	3/	624 4/	135	759	0	0	0	615	Converted Cattle
4. Little Sandy	4	5	101,094	8,042	5,743	7,578	1,562	9,140	674	136	810	8,252	Converted Cattle, Some Sheep in 1974 Increased Use
4a. Ltl Prospect	3	4	63,703	5,662	1,416	5,476	898	6,374	362	57	419	5,838	Some Converted Cattle
5. Steamboat Mtn	1	3	34,831	2,297	1,148	1,140	113	1,253	1,016	100	1,116	2,156	Converted Cattle Some Sheep 1974
6. Ltl Colorado	30	0	211,419	13,300	2,237	30,368	613	30,981	18,832	376	19,208	49,200	Some Converted Cattle
7. Red Desert	6	1	239,618	10,089	2,522	3,260	239	3,499	14,914	1,089	16,003	18,174	
8. Bush Rim	4	4	94,410	5,023	1,004	2,196 4/	35	1,231	5,534	157	5,691	6,720	
9. Continental Peak	3	3	82,811	3,956	3,147	3,276	348	3,624	3,678	392	4,070	6,954	
10. Pacific Creek	2	7	91,513	10,187	2,038	6,020	480	6,500	7,304	582	7,886	13,324	
11. Sands	6	2	105,776	4,930	1,345	2,903	112	3,015	2,656	102	2,758	5,559	Converted Cattle
12. White Acorn	1	5	40,444	2,600	3,750	2,112	639	2,751	2,123	643	2,766	4,235	Converted Cattle
13. Prospect Mtn	4	6	36,367	2,457	2,565	3,956	367	4,323	862	80	942	4,818	Some Converted Cattle
13a. Big Sandy Pasture	1	0	1,469	0	800	180	45	225	0	0	0	180	
13b. Buckskin-Sandy Fenced Area	1	0	7,365	638	680	742	398	1,140	0	0	0	742	
13c. Buckskin	1	0	1,[illegible]	1,152	2,127	42	67	109	0	0	0	42	
14. Reservoir	1	2	31,075	3,190	1,280	2,174	368	2,542	122	21	143	2,296	
15. Poston	2	1	46,195	3,640	800	2,719	338	3,057	1,386	172	1,558	4,105	
16. Pine Creek	1	0	12,469	1,240	380	706	73	779	628	64	692	1,334	
TOTALS			1,836,571	82,503	38,530	77,887	8,218	86,105	60,179	4,004	64,183	138,047	

1/ Does not include custodial pastures, Federal withdrawals, or no grazing area.

2/ Average use of 1974-75. Prior to 1974 the area east of Highway 187 except Bar X, Fish Creek, and Gold Creek was licensed in common. The Little Colorado Allotment received a 15% reduction in 1974.

3/ Willow Creek acreage included in Gold Creek figures. Common boundary not established.

4/ General licensing procedures resulted in 9 AUMs use in Willow Creek and 10 AUMs in Bush Rim over active base property qualifications.

5/ Total of actual use on NRL and nonuse on NRL.

Little Prospect Allotment

Two licensees turn 520 cattle onto the NRL to graze on May 1. One of these moves a portion of his cattle to the adjacent national forest July 1. All cattle are removed by October 1.

One licensee brings about 4,000 sheep onto the allotment May 1 to shear. They are split into smaller bands to lamb with dry ewes and yearlings trailed to other NRL in late May. These return in early July and are formed into four bands to go to the forest in mid-July. One band is trailed up and three are trucked. The sheep return to this allotment in mid-September. The lambs are sold in mid-October and the ewes trailed to other NRL fall range. This licensee has an individual use pasture which he uses at various times throughout the grazing season.

Steamboat Mountain Allotment

The individual licensee trails 180 cattle into this allotment May 1. Between December 1 and December 15, they are trailed back to their winter range. This allotment contains two individual use pastures which the licensee uses intermittently during the grazing season.

Little Colorado Allotment

Licensees put their stock on and remove them from it at various times. May 1 is the earliest turn-out date. The final removal of livestock occurs by February 28.

Twelve licensees put approximately 1,370 cattle on the allotment May 1. Of these cattle, 382 are removed by June 30 and the remainder are taken off by November 5.

Two of the same licensees put approximately 1,000 more cattle on for fall grazing beginning October 16. Approximately 450 are removed by December 31 and the remainder by February 28, depending on the severity of winter storms. All of the above mentioned cattle spend all or part of the winter on base properties.

Six licensees trail approximately 12,000 sheep onto the allotment May 1. All but about 2,500 of these are moved by July 15 to national forests or other NRL. Beginning September 1, sheep begin returning from the national forests to this allotment directly or by way of stops on other NRL. There are approximately 56,000 sheep on the allotment from October 16 to December 15, when they are trailed down to the checkerboard lands for the winter. The checkerboard land can open 15 days earlier if severe storms preclude use of this allotment to December 15.

There are currently six sheep licensees taking total nonuse that have requested conversions to cattle. Three licensees have partial temporary conversions to cattle with the remainder in nonuse. Seven licensees have licenses for other seasons.

Red Desert Allotment

Three licensees use this allotment with 14,800 sheep between November 3 and December 15. The sheep are trailed here from other allotments within the Sandy area and then are trailed to the adjacent checkerboard lands for the winter. One licensee is taking 87% nonuse (9,351 AUMs) and has inquired about converting to cattle, while the other two are each taking 55% nonuse (total 2,153 AUMs) for other reasons. There are also three other licensees taking total nonuse (3,591 AUMs) that have requested conversion to cattle.

Bush Rim Allotment

One licensee trails 1,300 sheep to this allotment for use between July 10 and September 9. Another licensee trails 2,300 sheep to this allotment for use between October 28 and November 27. Both of the above licensees bring their sheep from and remove them to other allotments in the Sandy area. One of these licensees is taking 75% nonuse (1,272 AUMs) for various reasons. There are two licensees taking total nonuse (4,221 AUMs) that have requested conversion to cattle.

Continental Peak Allotment

One licensee trails 2,500 sheep to the allotment for use from May 1 until July 15, when they go to the national forest. The licensee returns to the allotment with 7,500 sheep for one month's use between October 16 and November 15, as he moves toward his winter range on the checkerboard. Two licensees want to convert to cattle and are taking total nonuse (4,105 AUMs).

Pacific Creek Allotment

This is an individual allotment used by 5,000 sheep from May 3 to October 31. The sheep are trailed from here to another allotment in the Sandy area enroute to their winter range in the checkerboard. Twenty-five domestic horses use the allotment from May 1 to December 31 when they are trailed to base property for the winter. The licensee is taking 55% nonuse (8,183 AUMs) and has inquired about converting to cattle.

Sands Allotment

Three licensees turn 341 cattle onto the allotment in early May. They remain there until November 10, when 240 are moved to private lands. The remaining 101 are moved to the checkerboard for the winter. One of these licensees has a partial temporary conversion, while another is taking 67% nonuse (2,264 AUMs) and wants to convert to cattle.

One licensee trails approximately 4,750 sheep into the allotment for use just prior to entering the checkerboard lands about December 15 for the winter. Two others are taking total nonuse (573 AUMs) in the allotment.

White Acorn Allotment

The individual licensee trails 200 cattle to the fenced upper portion of the allotment for use from June 1 to October 15, when they are moved to private lands. The licensee also grazes 2,300 sheep here from May 3 to July 8, when they go to the national forest. These sheep return to this allotment September 1 and remain until October 25, when they are trailed south to another allotment in the Sandy area enroute to their winter range on the checkerboard lands. This licensee is taking 46% nonuse (1,780 AUMs).

Prospect Mountain Allotment

Three licensees turn 645 cattle out to graze the allotment on May 1, with another licensee putting 130 cattle on about June 15. These cattle stay for varying periods of time, but all are removed by October 15 to private lands. One of these licensees removes 396 cattle on June 30 and places them in four individual use pastures. These cattle are also moved to private lands by October 31. One other licensee has a private pasture within the allotment that he grazes with 300 cattle from June 1 to August 31.

One of the above licensees also has 3,200 sheep in the allotment from May 1 to July 20, when 2,200 go to the national forest. The other 1,000 sheep stay until September 10, when the others return from the forest and all are moved to another allotment in the Sandy area.

Reservoir Allotment

The individual licensee trails approximately 2,400 sheep into this allotment to lamb and graze from May 1 to July 10, when they are trailed to the national forest. About 2,000 sheep return to the allotment from September 11 to October 31, when they are trailed to another allotment in the Sandy area. Twenty domestic horses are licensed here from May 1 to December 31, when they are trailed to private lands for the winter.

Poston Allotment

One licensee grazes 117 cattle in the allotment from May 1 to June 30, when he trails them to private pastures. He has a license for 14 domestic horses with use from April 16 to December 31, when they are moved to private land. He also trails approximately 2,500 sheep into the allotment May 1 to lamb and graze until July 15, when they are trailed to the national forest. One other licensee trails approximately 1,500 sheep into the allotment from September 20 to October 22, when they are trailed to another allotment in the Sandy area.

Pine Creek Allotment

The individual licensee grazes 1,500 sheep from July 15 to October 1, then trails them to another allotment in the Sandy area. Currently 45% (564 AUMs) are licensed as nonuse. The licensee has requested conversion of sheep to cattle.

Individual Pastures

There are 34 individual use pastures utilized by 16 licensees. These pastures are used in conjunction with the allotment in which they are located. They have the same overall season with licensed use not to exceed carrying capacity of the NRL. All of these pastures are associated with fenced private meadows and/or ranch facilities. A brief description of the largest and most significant pastures follows.

Pastures C-6 and 7

These pastures are used primarily to keep domestic horses confined.

Pastures C-9 and 10

These pastures are used separately by two licensees to hold cattle which are being trucked into and out of the allotment. The pastures are used also during periods of the grazing season.

Pasture C-11

This pasture is used primarily for late summer grazing on meadows when cattle are removed from adjacent NRL.

Pastures C-15 and 16

These pastures are used intermittently throughout the season by sheep and some domestic horses. Lambs are shipped from here in the fall.

Pasture C-17

This pasture is used to gather and hold cattle prior to trucking out of the allotment in the fall.

Pasture C-19

This pasture is under lease from a licensee in the allotment and is grazed by horses used for pack trips into the

nearby national forest. The horses never use the common allotment.

Pasture C-21

This is a complex of four irrigated pastures that are basically used by approximately 1,600 cattle for about 30 days from mid-August to mid-September.

Pasture C-24

This pasture complex is used for spring lambing, cattle grazing and breeding, and fall cattle grazing. Some hay is produced on the private lands.

Pastures C-25, 26, and 30 and Buckskin-Sandy

These pasture complexes, used by one licensee, are licensed for summer and fall cattle grazing. Hay is also produced on private lands in C-25. The Buckskin-Sandy Pasture is that portion of Pasture 1 of the Prospect Mountain Allotment shown on MAP 1-3, excluding the portion of C-28 that is to be placed in the allotment. Buckskin-Sandy is currently an individual use pasture.

FARMING

Farming in the Sandy area is concentrated in the Eden Valley, which is predominantly fenced private land. No allotments are included in this area and it is not considered a part of the Sandy Area. There is also some farming on individual ranches along the Green River and northeast of the Eden Valley (MAP 2-36, located at the end of this chapter). The primary crop is hay—either grass, alfalfa, or a grass-alfalfa mix (FIGURE 2-49). Other crops of importance are small grains (barley and oats) and irrigated pasture.

The Eden Project includes approximately 17,000 acres of irrigated land. Water for irrigation comes from the Eden Valley and Big Sandy Reservoirs and the Big and Little Sandy Rivers (MAP 2-36). Wells are not a major source of irrigation water due to the water's poor quality (high in dissolved solids) and the depth to water. Irrigation is primarily by flooding with a few sprinkler systems (FIGURE 2-49).

Hay yields average 2½ tons per acre. Fertilization can increase grass hay yields to a maximum of 5 tons per acre and alfalfa yields to 4 tons per acre (per. comm., Carl Tomich April 16, 1976). Due to the short growing season, which varies from 100 to 130 days, farmers get only an average of 1 and 3/4 cuttings of alfalfa a year.

Hay yields along the Green River and on the ranches would be the same as in Eden Valley when irrigated. Small grain yields average 1,500 to 2,000 pounds per acre with fertilization increasing these to a maximum of 3,000 pounds per acre (per. comm., Carl Tomich April 16, 1976).

There are several livestock operators in the Sandy area with base properties in Eden Valley. They utilize their hay production in their livestock operation but occasionally must purchase extra hay from local farmers when it is available.

Farmers in the Eden Valley sell their hay locally to ranchers for their livestock operations, out of the area to individuals for domestic horse use, and to the Wyoming Game and Fish Department and ranchers for various uses. Consumption of hay grown in the Eden Valley is 50% locally and 50% elsewhere.

There are also farmers in Eden Valley who raise small numbers of livestock entirely on private lands within the project. Private lands in the eastern half of the Sandy area, including some custodial management pastures, do have irrigated meadows.

MINERAL RESOURCES

With the exception of the extreme northeastern portion along the Wind River Front and existing oil and gas wells, the entire Sandy area is designated as an unknown resource for oil and gas. The northeastern tip of the area is not considered a potential petroleum reservoir because its Precambrian granites and metamorphic rocks are not receptive to hydrocarbon accumulation and retention. Sedimentary rock units covering the balance of the Sandy area are suitable for oil and gas migration, accumulation, and retention.

Oil and gas are the only mineral commodities that are presently being produced, and most of the area's 15 fields are located on the LaBarge Platform along the western edge of the Green River use area of the Little Colorado Allotment. Fields also exist in the southeastern portion of the Sandy area, especially in the Red Desert and Sands Allotments. Wells such as the Rainbow Resources 26,000-foot test of the Madison Formation in the Pacific Creek Allotment (S. 34, T. 27 N., R. 103 W.) are indicative of the potential seen by oil companies. More than 50 new wells were drilled in 1977-78 (per. comm., Basko 1978), and extensive seismic exploration programs are ongoing throughout most of the area to locate new fields. There are over 1,200 miles of seismic trails in existence, and about 200 more miles are expected each year (per. comm., Fraher 1977).

The entire area is underlain with coal, but most of it is 3,000 feet or more below the surface, making it virtually impossible by today's standards to mine. The proposed Long Canyon Mine of about 31,000 acres, includes a small portion of the Sands Allotment (BLM 1978).

Gold, silver, copper, garnet, volcanic ash, sodium, coal, oil shale, and sand and gravel are present in the area, but they are either of low quality or not extractable at today's prices. From recorded notices of assessment work on unpatented mining claims, several thousand uranium claims are actively held in the area. A precise figure cannot be ascertained because many descriptions are vague. A mining operation at a jade claim in T. 29 N., and T. 30 N., R. 103 W., has produced more than one million pounds of jade (Glass 1978).

FIGURE 2-49 EDEN VALLEY. The hay fields and irrigation systems shown here are typical of the Eden Valley Irrigation Project. Farson is in the center background.

FORESTRY

Current timber sales are for posts, poles, and fuelwood. The post and pole sale areas are considered overstocked with lodgepole pine. Locations of these are shown on MAP 2-37. There are approximately 34 million board feet of lodgepole pine on 5,300 acres. The sales are used to thin stands rather than clearcut them. Sales are mostly to ranchers for corral poles and fence posts. Usually, they total less than 200 trees and average less than 15,000 board feet per year. The timbered areas adjacent to the Bridger-Teton National Forest are considered the only areas with commercial stands of timber in the Sandy area.

Fuelwood sales are concentrated in the conifer areas (MAP 2-37). Fuelwood sales remove dead material left by pine beetles, blister rust, and mistletoe. The 1976 fiscal year sales of fuelwood totaled about 86,000 board feet.

LAND USE PLANS, CONTROLS, AND CONSTRAINTS

Local Government

Sweetwater County, Lincoln County, Fremont County, and Sublette County governments have jurisdiction within the Sandy area. Sweetwater and Sublette currently have zoning ordinances. That part of the Sandy area within Sweetwater County is zoned agricultural. The portion of the Sandy area within Sublette County is zoned either resource conservation or general agriculture. Livestock grazing is consistent with both the resource conservation and agricultural zoning. The general agriculture designation applies generally to privately owned land, and resource conservation applies to Federal and State lands.

Sweetwater County is the only local government in the area with a land use or comprehensive plan. The existing use of the Sandy area is consistent with land use elements of the plan.

Other Agencies

Several other agencies have jurisdiction over lands within the Sandy area: Wyoming State Board of Land Commissioners, U.S. Forest Service, U.S. Bureau of Reclamation, and U.S. Fish and Wildlife Service. The planning and management policies currently guiding these agencies are consistent with the existing use of Sandy area resources. Briefly summarized, the applicable policies and uses are as follows:

Wyoming State Board of Land Commissioners

The 87,185 acres of granted State land in the Sandy area are leased to livestock operators for a ten (10) year term. The lessee is considered the guardian of the land, which is not open to public access unless an easement is approved by the Wyoming State Land Board and recorded in the office of the Commissioner of Public Lands.

U.S. Forest Service

The Forest Service manages approximately 160 acres of withdrawn land in the Sandy area (MAP 1-2). Current usage of Forest Service land is a campground and a horse pasture. These uses present no conflicts with existing uses of surrounding NRL.

U.S. Bureau of Reclamation

A total of 134,360 acres in the Sandy area are managed for irrigation and recreation purposes by the Bureau of Reclamation. On those areas not intensively used for these purposes, BLM has retained by agreement jurisdiction over livestock grazing. No conflicts with current use exist.

U.S. Fish and Wildlife Service

The Seedskadee Wildlife Refuge lies partially within the Sandy area and encompasses nearly 1,600 acres. No conflicts exist on current usage, as BLM administers the grazing on all unfenced lands by agreement with USFWS.

SOCIOECONOMIC CONDITIONS

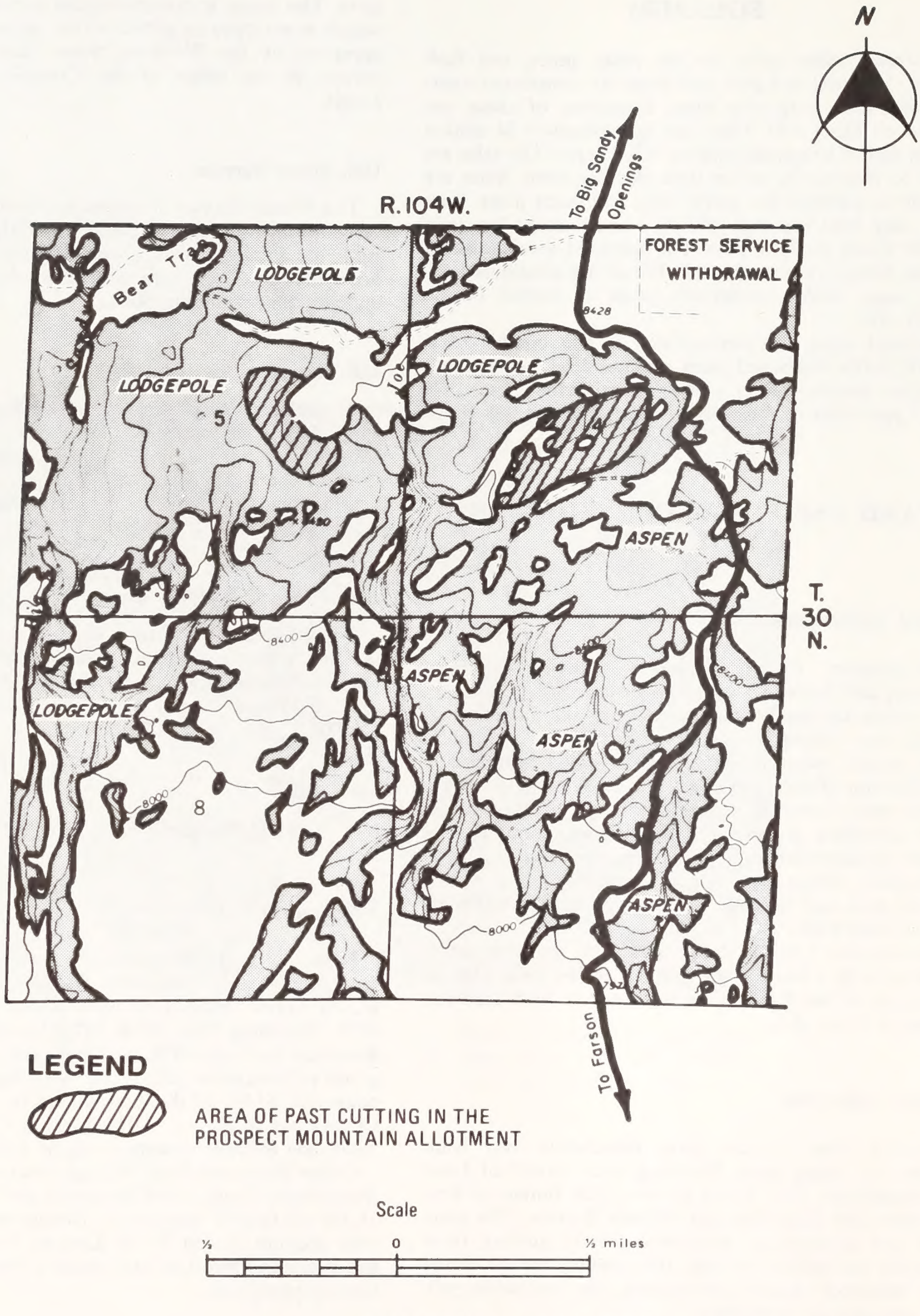
Population

Based on the latest studies, the total population in the four counties that include the Sandy area is estimated at 62,276 (THK Associates 1976, Schmidt and Yaquinta 1976, Wyoming Data Book 1972, University of Denver Research Institute 1975, and per. comm., Janet Montgomery November 23, 1976). Sweetwater County accounts for 61.5% of the total population, or 38,310. Uinta County has 16.1%, or 10,018; Lincoln County, 15.8%, or 9,868; and Sublette County, 6.6% or 4,080.

Green River and Rock Springs constitute 84.1% of the Sweetwater County total. Evanston and Lyman comprise 76.3% of Uinta's population. Kemmerer and Diamondville account for 36.7% of Lincoln County totals, and Big Piney and Pinedale have about 37.9% of the Sublette County population.

Income

Total personal income in the four-county region was $271,756,000 in 1974 (Bureau of Economic Analysis



EXISTING TIMBER SALE AREAS

SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 2 - 37

1976), which is the latest information. Farm income (including proprietors and labor) was $10,639,000 or 3.9% of total income in that year. See TABLE 2-71 for total personal and farm income by county. Farm income as a percent of total income in the region has experienced a significant decline in recent years; 1972 data show farm earnings as 14% of regional income (Bureau of Economic Analysis 1974). The decline was primarily the result of mineral and power plant developments in Sweetwater and Lincoln Counties that significantly increased incomes in the mining and construction sectors. For analytic purposes, a six-year average (1969 through 1974) is used throughout the remainder of this ES to measure farm income as a percent of total income. This procedure provides a more uniform measure than a percent based upon one year's data. During the 1969 through 1974 period, farm income (including proprietors and labor) in the region averaged $16,233,330 per year and total personal income averaged $162,644,670 per year (Bureau of Economic Analysis 1976). Therefore, over the six-year period farm income was an average of 10% ($16,233,330 divided by $162,644,670 = .0998) of total regional income.

Livestock

Specific information on the contribution of the region's livestock industry to farm income is not available; however, an estimate can be derived from the market value of agricultural products sold. In 1974, livestock and their products accounted for 84% of the market value of all agricultural products sold in the four-county region (Census of Agriculture 1974; pp. IV-74, IV-110, IV-116, and IV-128). In contrast, the livestock industry in 1969 accounted for 94% of the market value of all agricultural products sold. An average of these two years (89%) would probably provide a closer estimate of the livestock industry's contribution to total farm income in the region. This figure is greater than a state-wide estimate of 78%, which was based upon similar data averaged over the 1970 through 1975 period (Wyoming Agricultural Statistics 1976, p. 11). The difference between the two values reflects the general situation in southwest Wyoming where climatic and soil conditions prohibit extensive farming but vast tracts of grazing lands occur. Consequently, the agricultural sector in the region is much more livestock oriented than in some other parts of the state. The estimates derived above indicate that on the average personal income in the livestock industry in the four-county region is approximately $14,447,664 per year (.89 x $16,233,330 (six-year average of farm income) = $14,447,664), accounting for about 9% of the region's average total personal income.

The contribution of the Sandy area's AUMs to regional income can also be estimated. There are currently 150,288 AUMs (private, State, and Federal) available in the Sandy area (see TABLE 2-24), and the current value per AUM is $7.70 (Economic Research Service 1977). The direct income effect upon the region with full use would be, therefore, $1,157,217.60 ($7.70 x 150,288 AUMs = $1,157,217.60). This direct income from Sandy AUMs would generate additional income as livestock operators spent it throughout the region. For each dollar that they spent, an additional $2.75 would be generated (Hooker and Potter 1971). The total income effect is, therefore, $3,182,348.40 (2.75 x $1,157,217.60 = $3,182;348,40).

In order to determine the contribution of the Sandy area's AUMs to total personal and farm income, direct income must be reduced to net income. Specific information is not available on a county basis; however, an approximate amount can be derived from similar state data. During the period 1966 through 1975, total net income averaged 23.8% (weighted average) of the cash receipts from farm marketings in Wyoming (Wyoming Agricultural Statistics 1976; p. 10). While it is realized that this is only an approximation, it would indicate that personal income resulting from Sandy area AUMs is about $275,418 per year ($1,157,217.60 x .238 = $275,417.79). This is approximately 2% of average regional farm income ($275,418 divided by $14,447,664 = .019) and less than 1% of total personal income.

Even though income from Sandy AUMs is not significant on a regional basis, it is highly significant to the ranchers who depend upon the area. As indicated on TABLE 2-69, Sandy area licensees are, on the average, dependent upon it for 32% of their operations. Dependency ranges from 5% to 57% of a rancher's operation. Those ranchers who rely on the Sandy's use for a significant portion of their operations are most sensitive to any changes in management or use levels because their total operation, and therefore their means of livelihood, is at stake. It should be noted, that ten licensees take total nonuse of their AUMs, and five others take substantial nonuse. Actual use in the Sandy area is 86,105 AUMs (private, State, and Federal); see TABLE 2-70.

Recreation

The estimated total expenditures resulting from recreational activities in the Sandy area are shown on TABLE 2-72. While these activities occur in the Sandy area, nearly all the expenditures would be made outside the area because few facilities exist there. Expenditures by residents of the four-state region are considered cash flows within the regional economy and do not create new income. Expenditures in the region by nonresidents of Wyoming and persons from other Wyoming counties who visit the Sandy area and make expenditures in the region do create new income. It is estimated that approximately 20% of the visitor days shown on TABLE 2-67 can be attributed to nonresidents of the region (per. comm., Phillips 1978). This figure is based upon estimates of resident and nonresident hunting and fishing days, estimates of resident and nonresident expenditures in Wyoming, and possible double counting of visitor days (i.e. concurrent fishing and camping counted as two days). The direct income effect to the regional economy by recreational use of the Sandy area, therefore, is approximately $290,514 ($1,452,569.06 x 0.2 = $290,513.81) if this same proportion is applied to total expenditures (see TABLE 2-72). This income would primarily go to

TABLE 2-71

REGIONAL PERSONAL INCOME 1974
(Thousands of Dollars)

	Lincoln County	Sweetwater County	Sublette County	Uinta County	Region
Total Personal Income	$42,924	$187,539	$15,616	$25,677	$271,756
Farm Income	$4,894	$1,479	$2,616	$1,650	$10,639
Farm Income as a percent of total income	11.4%	0.8%	16.8%	6.4%	3.9%

Source: Local Area Personal Income 1969-1974, Department of Commerce, Bureau of Economic Analysis (June 1976).

TABLE 2-72

1974 LABOR FORCE - REGION AND SELECTED COUNTIES

	REGION	% OF FORCE	LINCOLN	% OF FORCE	SUBLETTE	% OF FORCE	SWEETWATER	% OF FORCE	UINTA	% OF FORCE
Total Labor Force	25,410		4,220		2,030		15,570		3,590	
Unemployed	810		200		50		440		120	
Unemployed Rate %	3.2		4.7		2.5		2.8		3.3	
UI* Covered Employment	17,770	(69.9%)	2,270	(53.8%)	880	(43.3%)	12,600	(80.9%)	2,020	(56.3%)
Manufacturing	730	(2.9%)	230	(5.5%)	20	(1.0%)	320	(2.0%)	160	(4.5%)
Nonmanufacturing	17,040	(67.1%)	2,040	(48.3%)	860	(42.4%)	12,280	(78.9%)	1,860	(51.8%)
Agricultural	-0-		-0-		-0-		-0-		-0-	
Mining	3,740	(14.7%)	460	(10.9%)	180	(8.9%)	2,970	(19.0%)	130	(3.6%)
Construction	5,320	(20.9%)	630	(14.9%)	220	(10.8%)	4,300	(27.6%)	170	(4.7%)
Trans., Comm., Util.	1,190	(4.7%)	240	(5.7%)	100	(4.9%)	730	(4.7%)	120	(3.3%)
Trade	3,900	(15.3%)	520	(12.3%)	220	(10.8%)	2,420	(15.5%)	740	(20.6%)
Fin., Ins.,Real Est.	340	(1.3%)	50	(1.2%)	30	(1.5%)	200	(1.3%)	60	(1.7%)
Services	1,740	(6.8%)	130	(3.1%)	110	(5.4%)	1,240	(8.0%)	260	(7.2%)
Government	810	(3.2%)	10	(.2%)	-0-		420	(2.7%)	380	(10.6%)
Noncovered Employment	6,830	(26.9%)	1,750	(41.5%)	1,100	(54.2%)	2,530	(16.2%)	1,450	(40.4%)
Nonagricultural	5,080	(20.0%)	1,140	(27.0%)	630	(31.0%)	2,210	(14.2%)	1,100	(30.6%)
Nonprofit Inst.	160	(0.6%)	20	(.5%)	20	(1.0%)	100	(0.6%)	20	(.6%)
All Other Nonagricltrl.	2,050	(8.1%)	440	(10.4%)	340	(16.7%)	1,040	(6.7%)	230	(6.4%)
Railroads	700	(2.8%)	60	(1.4%)	-0-		340	(2.2%)	300	(8.4%)
Fed. Government	350	(1.4%)	80	(1.9%)	40	(2.0%)	190	(1.2%)	50	(1.4%)
State and Local Gov.	1,810	(7.1%)	540	(12.8%)	230	(11.3%)	540	(3.5%)	500	(13.9%)
Agriculture	1,750	(6.9%)	610	(14.5%)	470	(23.2%)	320	(2.0%)	350	(9.7%)

*Unemployment Insurance

Source: Employment Security Commission of Wyoming. (As of June 1, 1976, the most recent complete data available on Wyoming statewide annual employment average is for the year 1974.)

the services sector of the regional economy in gasoline sales, hotels and motels, and eating establishments. Each dollar of income in the region spent for recreation is estimated to generate an additional 2.53 dollars (average of multipliers for gasoline sales, hotels and motels, and eating establishments) in the economy (Hooker and Potter 1971). The current total income derived, therefore, is about $735,000 ($290,514 x 2.53 = $735,000.42). Information is not available to determine personal income for the services sector, and the above values should not be compared with farm income or total personal income as discussed above.

Employment

TABLE 2-73 reflects the most current information regarding employment in the region. Construction (20.9%), trade (15.3%), mining (14.7%), and government (11.7%) are the most important employment sectors on a regional basis. However, a good deal of variation exists among the counties constituting the region.

Agricultural employment in the region accounts for 6.9% of total regional employment. The figures do not indicate that portion of agricultural employment that is attributable to livestock production, but a representative estimate can be made using the same procedure used in the Income section. Assuming that employment requirements for different agricultural activities are similar, livestock operations should be accountable for approximately 89% of total agricultural employment. This, in turn, means that approximately 6.1% of total regional employment is attributable to livestock operations.

An estimate of the contribution of Sandy area ranches to regional livestock employment was calculated using average manpower figures derived for cattle and sheep operations in published data (Stevens 1971 and 1975) and applying them to Sandy area ranches. It was determined that the equivalent of approximately 233 jobs are generated by Sandy area ranches (see APPENDIX 3E). This constitutes approximately 16% of regional livestock employment, 13% of regional agricultural employment, and less than 1% of total regional employment.

The contribution of Sandy area resources is estimated to be approximately 2% of regional livestock employment. This was determined by converting total Sandy area AUMs in actual use to sheep and cattle units. Manpower figures per cattle and per sheep unit were than applied to the derived cattle and sheep units. (Cattle = 9.4 hours per cattle unit; sheep = 900 sheep units per man-equivalent). The average sheep ranch in southwest Wyoming has 8 man-equivalents per ranch based on the average mountain valley cattle ranch.

Attitudes and Expectations

The concerns of residents in the Sandy area generally center on one theme, maintaining what they consider to be a rich and rewarding way of life. This way of life is dependent upon the land and reflects traditional western attitudes of independence, self-sufficiency, and a love of the outdoors. They consider the open spaces of the West essential to their well-being, and they believe the rural atmosphere of the area is worth keeping. Actions by the government that would restrict their own actions; reduce through tighter regulations their ability to make a living from the land; or reduce the wide-open spaces in the area are against their fundamental beliefs (ENVIROS 1976). A copy of the ENVIROS contract report is available for review in the Rock Springs District Office.

FUTURE ENVIRONMENT WITHOUT THE PROPOSAL

This section describes the resources and land uses that most likely would be found in the Sandy area in 23 years (Year 2000) without implementation of the proposed action as described in Chapter 1. That timeframe is considered because it is the point at which the objectives of the proposed action (TABLE 1-8) are expected to be met.

No significant changes from current conditions would be expected in air quality, geology, topography, climate, and farming. Extremely clean air is an area trademark, and the frequency and intensity of air movement in the area assures good dispersion of pollutants (Northern Great Plains Resources Program 1975). No significant increase in the major manmade sources of air pollution would be anticipated in the area (Northern Great Plains Resources Program 1975), and any future developments would be subject to national and state air quality standards. Becker and Alyea (1964a) note that accurate long-range weather forecasts are not available, but they assume that "climate changes gradually and is nearly constant for periods of 30 years for various meteorological stations ..." Thus, while variations in normal precipitation and temperature (Becker and Alyea 1964a, 1964b) could be expected, it can be assumed climatic conditions in the area would be similar to current conditions. Hunt (1974) notes that geological and topographical changes occur over extremely long periods of time. While some increase in hay production would be anticipated, no major changes would be expected in area farming activities.

SOILS

Based on present data, current rate of sheet erosion (8,378,610 tons per year) would continue. Without improved livestock management, the rate could increase. Without proposed water developments, compaction near the existing waters could increase with the increased relative intensity of use that would result from greater numbers of livestock on the range.

Predicted increases in recreation use, oil and gas production, and wildlife production would deplete the soils in the areas where these activities would be concentrated. Without site-specific information, the levels of increase in compaction and erosion are difficult to quantify with any accuracy.

TABLE 2-73
1975 VALUATIONS

County	Total Valuation	Cattle		Sheep		Sheep & Cattle	
		Valuation	% of Total	Valuation	% of Total	Valuation	% of Total
Lincoln	$ 82,382,479	$ 183,174	0.2	$1,587,430	1.90	$1,770,604	2.10
Sublette	$ 53,939,914	$3,049,440	5.7	$ 47,482	0.10	$3,096,922	5.70
Sweetwater	$272,686,428	$ 601,155	0.2	$ 423,202	0.16	$1,024,357	0.38
Uinta	$ 27,389,535	$1,418,785	5.2	$ 230,659	0.84	$1,649,444	6.00
Region	$436,398,000*	$5,253,000	1.2	$2,289,000	0.50	$7,541,000	1.80

*Rounded figures for region.
Source: 1975 Wyoming Ad Valorem Tax Report.

WATER RESOURCES

Water Use

Water use by livestock, wild horses, and wildlife would remain essentially unchanged (110 acre-feet per year); however, consumptive uses are projected to increase (TABLE 2-74).

In order to meet the increasing demands for Green River water and utilize the water allotted to Wyoming under the provision of the Upper Colorado River Basin Compact of 1948, several potential reservoirs and diversions have been proposed. TABLE 2-75 is a representative listing of such projects. Further information is available at the office of the Wyoming State Engineer.

Due to legal and political constraints, it is impossible to predict which, if any, of these projects would be built by the year 2000 or predict the future streamflows in the Sandy area. As water quality is dependent on flow, it is not possible to predict the future sediment, dissolved solids, or fecal coliform concentrations; however, trends can be predicted due to land and water use.

Sediment yields would decrease with the attenuation of high peak flows due to increased reservoir storage. Channel stability would continue to decrease as willow cover decreases with livestock use. Bank erosion would increase with decreasing channel stability. Fecal coliforms would increase due to a decrease in streambank vegetation cover and decreased channel stability. Dissolved solid concentrations could increase on the Big Sandy and Green Rivers due to depletion of high-quality waters in the upper portions of these basins.

VEGETATION

The predicted AUM production by allotment is summarized in TABLE 2-76. Predicted future range condition and apparent trend by allotment are shown in TABLE 2-77.

Predicted future range condition of the vegetation in the Sandy area is shown on MAPS 2-38 through 2-43, located at the end of this chapter. For each animal class by allotment more detailed information is available for review in the Rock Springs District Office.

Most of the acreage in the Sandy area would be expected to continue at the present level of production (TABLE 2-76). In 23 years, it is predicted that there will be 338,407 acres in good; 1,125,031 acres in fair; and 504,294 in poor condition for cattle, and 255,006 acres in good; 1,541,863 acres in fair; and 170,861 acres in poor condition for sheep.

The apparent range trend studies conducted in 1976 are the basis for the future predictions of AUM production as well as for future range condition. Direction of the apparent range trend, it is anticipated, would not change significantly from the present situation (TABLE 2-31). Based on grazing management in the Sandy area remaining at the same level, those areas presently in good fair and poor range condition for livestock would be expected to continue the same trend (TABLE 2-31).

Vegetation types, other than meadow types, would be expected to remain fairly stable. Meadows would be adversely impacted where cattle use would be predominant without proper waters developments. The percent composition of the desirable species would decline, vigor would go down, and the invasion of tap-rooted shrub species would occur. Where sheep use is predominant, meadows should remain fairly stable.

Poisonous plants would increase slightly over the 23-year period. The major increase would occur in the downward trend meadows where death camas is present and in some of the mountain shrub types where lupine and larkspur are most common. Halogeton may tend to spread into areas where extensive surface disturbances occur.

The future situation regarding threatened or endangered plant species is unpredictable since the precise locations of plant species in that category are unknown at this time.

WILDLIFE

Terrestrial

In the near future, wildlife habitat plans would be implemented in the Sandy area. These plans would call for construction of additional waters for wildlife use. These waters would be limited to areas currently used by big game in the summer. Based on current conditions and apparent trends, critical wildlife habitat would continue to decline in quality. A limited number of additional fences would be placed on national resource lands in site-specific cases to control livestock. Thus, some of the existing unrestricted movements by wildlife would be reduced.

Wildlife populations are expected to reach and be maintained at levels in the Wyoming Game and Fish Department's Strategic Plan (1975b). That plan would maintain the elk populations at current levels and increase pronghorn by 34%, increase mule deer 71.5%, and increase moose 66% over current levels (see TABLE 2-36). Wildlife habitat would be modified to some degree by energy development activities.

Aquatic

The future condition of aquatic habitat and fisheries populations in the Sandy area focuses around trends of declining habitat quality and water flow volumes. Streams within 5 to 10 miles of the forest boundary could be expected to support a "put-and-take"fishery, but streams below this point would probably support little, if any, game or sport fishery. The cumulative effects of sedimentation, increased temperatures, and water withdrawals for irrigation would become more pro-

TABLE 2-74

PRESENT AND PROJECTED CONSUMPTIVE WATER USES
IN THE GREEN RIVER AND GREAT DIVIDE BASINS

	(In 1,000 Acre-Feet)		
	1975	1980	2000
Agriculture	268	339	408
Industrial	30	55	86
Municipal, Domestic & Stock	6	6	7
Recreation, Fish & Wildlife 1/	--	20	20
Transbasin Diversion	7	15	31
Storage Project Evaporation	--	92	92
Potential Irrigation	--	--	164
Potential Transbasin Diversions 2/	--	--	272
TOTAL	311	527	1,080

1/ Recreational water use presently consumes less than 1,000 acre-feet per year. Future use was not estimated.

2/ The amount of these potential uses will depend upon the demands for water that develop, the amount of water determined available under the Colorado River compacts, and the amount of water imported from other sources.

Source: Wyoming Water Planning Program 1970.

TABLE 2-75

POTENTIAL RESERVOIRS AND DIVERSIONS

Project	Streams Affected in Sandy Area
Kendall Reservoir (Upper Green River)	Green River
Newfork Narrows Reservoir (Lower Newfork River)	Green River
Boulder Reservoir (Upper Boulder Creek)	Green River
Sanders Ranch Reservoir (Upper Big Sandy River)	Big Sandy River
Lower Green River Reservoir (Lower Green River)	Green River
Lower Green River Reservoir (to Rawlins Diversion)	Green River
Newfork Narrows Reservoir (to Rawlins)	Green River
Kendall Reservoir (to Sweetwater River)	Green River
Boulder Reservoir (to Sweetwater River)	Green River

Source: Lowham, et al. 1976.

TABLE 2-76

PREDICTED FUTURE LONG-TERM PRODUCTION AND USE WITHOUT THE PROPOSAL BY ANIMAL CLASS IN AUMs AND POUNDS OF DRY WEIGHT FORAGE

	Cattle and Domestic Horses		Sheep		Wild Horses	
Allotment	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
1. Bar X	847,080 (1,086)	686,400 (880)	933,750 (1,245)	57,000 (76)	0 (0)	0 (0)
2. Fish Creek	818,220 (1,049)	769,860 (987)	849,000 (1,132)	0 (0)	0 (0)	0 (0)
3. Gold Creek	2,825,160 (3,622)	2,626,260 (3,367)	2,579,250 (3,439)	0 (0)	0 (0)	0 (0)
3a. Willow Creek	614,640 (788)	652,080 (836)	563,250 (751)	0 (0)	0 (0)	0 (0)
4. Little Sandy	6,786,000	6,101,940	7,810,500	201,750	(0)	(0)
4a. Little Prospect	4,555,980 (5,841)	1,921,920 (2,464)	5,206,500 (6,942)	2,541,000 (3,388)	0 (0)	0 (0)
5. Steamboat Mountain	1,404,000 (1,800)	329,940 (423)	1,509,000 (2,012)	824,250 (1,099)	0 (0)	0 (0)
6. Little Colorado	29,835,780 (38,251)	5,709,600 (7,320)	31,318,500 (41,758)	24,954,750 (33,273)	34,425,900 (38,251)	1,620,000 (1,800)
7. Red Desert	9,539,400 (12,230)	0 (0)	12,907,500 (17,210)	11,194,500 (14,926)	11,007,000 (12,230)	4,749,300 (5,277)
8. Bush Rim	4,707,300 (6,035)	0 (0)	5,292,000 (7,056)	4,025,250 (5,367)	5,431,500 (6,035)	1,206,000 (1,340)
9. Continental Peak	4,978,740 (6,383)	0 (0)	5,466,750 (7,289)	5,025,000 (6,700)	5,744,700 (6,383)	1,064,700 (1,183)
10. Pacific Creek	8,276,580 (10,611)	494,520 (634)	10,014,000 (13,352)	8,748,750 (11,665)	0 (0)	0 (0)
11. Sands	4,172,220 (5,349)	1,977,300 (2,535)	4,671,000 (6,228)	1,805,250 (2,407)	0 (0)	0 (0)
12. White Acorn	4,195,620 (5,379)	706,680 (906)	4,087,500 (5,450)	3,433,500 (4,578)	0 (0)	0 (0)
13. Prospect Mountain	4,188,600 (5,370)	1,955,460 (2,507)	4,515,750 (6,021)	2,106,000 (2,808)	0 (0)	0 (0)
14. Reservoir	1,274,520 (1,634)	0 (0)	1,683,750 (2,245)	1,631,250 (2,175)	0 (0)	0 (0)
15. Poston	2,693,340 (3,453)	297,960 (382)	3,415,500 (4,554)	3,211,500 (4,282)	0 (0)	0 (0)
16. Pine Creek	943,020 (1,209)	706,680 (906)	1,179,750 (1,573)	426,000 (568)	0 (0)	0 (0)
TOTALS	92,656,200 (118,790)	24,936,600 (31,970)	104,003,250 (138,671)	70,185,750 (93,581)	56,609,100 (62,899)	8,640,000 (9,600)

TABLE 2-76 (Con't)

PREDICTED FUTURE LONG TERM PRODUCTION AND USE WITHOUT THE
PROPOSAL BY ANIMAL CLASS IN AUMs AND POUNDS OF DRY WEIGHT FORAGE

	Antelope		Deer		Elk		Moose	
Allotment	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
1. Bar X	561,782 (697)	29,822 (37)	626,430 (1,330)	75,360 (160)	0 (0)	0 (0)	0 (0)	0 (0)
2. Fish Creek	807,612 (1,002)	36,270 (45)	1,047,504 (2,224)	75,360 (160)	0 (0)	0 (0)	359,100 (665)	19,440 (36)
3. Gold Creek	1,848,964 (2,294)	120,900 (150)	2,177,904 (4,624)	399,879 (849)	2,266,380 (4,197)	317,520 (588)	631,260 (1,169)	37,800 (70)
3a. Willow Creek	405,418 (503)	33,046 (41)	472,884 (1,004)	95,142 (202)	527,580 (977)	129,600 (240)	136,620 (253)	14,040 (26)
4. Little Sandy	9,040,902 (11,217)	490,854 (609)	9,215,115 (19,565)	1,988,091 (4,221)	1,976,940 (3,661	967,140	779,220	122,580
4a. Little Prospect	6,027,268 (7,478)	301,444 (374)	6,143,724 (13,044)	1,211,883 (2,573)	1,317,600 (2,440)	1,007,100 (1,865)	519,480 (962)	104,220 (193)
5. Steamboat Mountain	1,744,812 (2,202)	124,124 (154)	1,764,366 (3,746)	72,534 (154)	1,876,500 (3,475)	77,760 (144)	0 (0)	0 (0)
6. Little Colorado	45,854,146 (56,891	2,414,776 (2,996)	6,581,283 (13,973)	168,618 (358)	1,189,080 (2,202)	0 (0)	0 (0)	0 (0)
7. Red Desert	13,311,090 (16,515)	519,870 (645)	4,902,168 (10,408)	424,842 (902)	1,520,640 (2,816)	99,360 (184)	0 (0)	0 (0)
8. Bush Rim	6,055,478 (7,513)	336,102 (417)	3,180,663 (6,753)	176,154 (374)	4,962,060 (9,198)	172,800 (320)	0 (0)	0 (0)
9. Continental Peak	5,528,354 (6,859)	270,010 (335)	4,635,111 (9,841)	538,353 (1,143)	3,104,460 (5,749)	108,000 (200)	0 (0)	0 (0)
10. Pacific Creek	7,783,542 (9,657)	761,670 (945)	8,338,584 (17,704)	313,215 (665)	4,728,780 (8,757)	457,920 (848)	72,900 (135)	53,460 (99)
11. Sands	5,285,748 (6,558)	310,310 (385)	6,337,305 (13,455)	188,871 (401)	5,663,520 (10,488)	228,960 (424)	0 (0)	0 (0)
12. White Acorn	2,893,540 (3,590)	188,604 (234)	3,141,099 (6,669)	756,426 (1,606)	1,695,060 (3,139)	466,560 (864)	966,060 (1,789)	51,840 (96)
13. Prospect Mountain	4,569,214 (5,669)	268,398 (333)	4,752,390 (10,090)	755,955 (1,605)	1,015,740 (1,881)	535,680 (992)	234,360 (434)	58,320 (108)
14. Reservoir	1,810,276 (2,246)	146,692 (182)	1,823,712 (3,872)	349,482 (742)	0 (0)	0 (0)	54,000 (100)	25,920 (48)
15. Poston	3,487,562 (4,327)	146,692 (182)	2,995,560 (6,360)	29,202 (62)	0 (0)	0 (0)	32,400 (60)	19,440 (36)
16. Pine Creek	673,816 (836)	42,718 (53)	657,987 (1,397)	113,511 (241)	187,380 (347)	0 (0)	242,460 (449)	19,440 (36)
TOTALS	117,719,524 (146,054)	6,542,302 (8,117)	68,793,789 (146,059)	7,732,878 (16,418)	32,031,720 (59,327)	4,568,400 (8,460)	4,027,860 (7,459)	526,500 (975)

TABLE 2-77

PREDICTED FUTURE RANGE CONDITION IN ACRES FOR MAJOR ANIMAL SPECIES BY ALLOTMENT AND CUSTODIAL PASTURE

Allotment	Condition Rating	Cattle and Domestic Horses	Sheep	Wild Horses	Pronghorn Antelope	Mule Deer	Elk	Moose
Bar X	Good	0	0	0	6,401	6,844	0	3,947
	Fair	3,758	6,895	0	494	51	0	1,209
	Poor	3,137	0	0	0	0	0	0
	Marginal Use	0	0	6,895	0	0	6,895	1,739
Fish Creek	Good	77	0	0	4,961	6,346	0	2,041
	Fair	6,318	6,882	0	2,276	891	0	4,380
	Poor	842	355	0	0	0	0	816
	Marginal Use	0	0	7,237	0	0	7,237	0
Gold Creek	Good	13,296	22,013	13,296	10,815	20,386	16,130	14,122
	Fair	16,972	8,512	16,972	16,614	8,834	6,015	13,348
	Poor	257	0	257	3,096	1,305	307	3,055
	Marginal Use	0	0	0	0	0	8,073	0
Little Sandy-Little Prospect	Good	5,122	5,300	5,122	121,523	132,141	39,526	24,978
	Fair	134,177	176,238	134,177	55,397	50,088	11,522	18,267
	Poor	46,361	4,122	46,361	8,740	3,431	0	1,434
	Marginal Use	0	0	0	0	0	134,612	140,981
Steamboat Mountain	Good	7,255	0	0	16,632	13,192	13,645	0
	Fair	21,908	38,030	0	21,721	21,713	24,453	0
	Poor	11,374	2,507	0	2,184	4,377	2,439	0
	Marginal Use	0	0	40,537	0	1,255	0	40,537
Little Colorado:								
Green River Use Area	Good	0	6,649	0	170,809	35,660	0	1,073
	Fair	173,751	254,636	173,751	119,401	22,870	0	4,427
	Poor	130,040	42,506	130,040	13,581	2,936	0	8,368
	Marginal Use	0	0	0	0	242,325	303,791	289,923
Farson Use Area	Good	13,352	38,799	13,352	160,771	2,243	0	230
	Fair	92,173	153,734	92,173	34,880	921	0	486
	Poor	99,598	12,590	99,598	9,472	0	0	0
	Marginal Use	0	0	0	0	201,959	205,123	204,407
Big Sandy Use Area	Good	0	0	0	159,176	49,910	11,804	0
	Fair	181,568	213,273	181,568	56,685	14,598	8,678	0
	Poor	36,474	4,769	36,474	2,181	4,358	0	0
	Marginal Use	0	0	0	0	149,176	197,560	218,042
Red Desert	Good	151,095	76,760	151,095	126,509	1,177	5,910	0
	Fair	83,349	117,315	83,349	84,898	783	23,606	0
	Poor	10,931	51,300	10,931	33,968	298	5,400	0
	Marginal Use	0	0	0	0	243,117	210,459	245,375
Bush Rim	Good	49,833	65,307	49,833	46,621	30,190	29,177	0
	Fair	48,339	39,240	48,339	47,022	12,048	24,832	0
	Poor	6,375	0	6,375	10.904	10,862	11,675	0
	Marginal Use	0	0	0	0	51,447	38,863	104,547
Continental Peak	Good	1,305	0	1,305	41,115	55,746	0	0
	Fair	69,340	88,324	69,340	46,697	20,360	1,229	0
	Poor	17,833	154	17,833	666	1,793	103	0
	Marginal Use	0	0	0	0	10,579	87,146	88,478
Pacific Creek	Good	67,621	11,212	67,621	181,512	165,176	75,049	6,216
	Fair	109,440	187,819	109,440	17,223	27,078	23,862	5,179
	Poor	25,795	3,825	25,795	4,121	10,602	6,040	1,792
	Marginal Use	0	0	0	0	0	97,905	189,669
Sands	Good	18,165	0	18,165	78,019	86,474	68,329	0
	Fair	38,346	69,043	38,346	35,424	26,995	28,208	0
	Poor	58,341	45,809	58,341	1,409	1,332	1,767	0
	Marginal Use	0	0	0	0	51	16,548	114,852
White Acorn	Good	0	15,269	0	23,020	21,062	9,250	17,589
	Fair	39,056	31,525	0	19,686	21,255	4,287	15,318
	Poor	7,738	0	0	4,088	4,477	0	3,708
	Marginal Use	0	0	46,794	0	0	33,257	10,179
Prospect Mountain	Good	0	13,389	0	42,557	47,133	10,587	30,643
	Fair	44,850	50,515	0	20,396	17,087	1,687	16,354
	Poor	21,901	2,847	0	3,789	2,531	438	2,489
	Marginal Use	0	0	66,751	0	0	54,039	17,265
Reservoir	Good	0	0	0	29,402	25,727	0	3,245
	Fair	23,318	35,545	0	6,143	7,079	0	1,690
	Poor	12,227	0	0	0	0	0	1,401
	Marginal Use	0	0	35,545	0	2,739	25,545	29,209
Poston	Good	0	0	0	38,937	29,230	0	3,020
	Fair	35,565	50,635	0	11,006	15,312	0	359
	Poor	15,070	0	0	692	0	0	172
	Marginal Use	0	0	50,635	0	6,093	50,635	47,084
Pine Creek	Good	11,286	308	0	12,045	12,996	1,639	5,780
	Fair	2,803	13,704	0	1,693	640	0	7,925
	Poor	0	77	0	351	453	0	384
	Marginal Use	0	0	14,089	0	0	12,450	0
TOTAL ALLOTMENT	Good	338,407	255,006	319,789	1,270,825	741,633	281,046	112,884
	Fair	1,125,031	1,541,865	947,455	597,656	268,603	158,379	88,942
	Poor	504,294	170,861	432,005	99,251	48,755	28,169	23,619
	Marginal Use	0	0	268,483	0	908,741	1,500,138	1,742,287
		1,967,732	1,967,732	1,967,732	1,967,732	1,967,732	1,967,732	1,967,732

TABLE 2-77 (Continued)

PREDICTED FUTURE RANGE CONDITION IN ACRES FOR MAJOR ANIMAL SPECIES BY ALLOTMENT AND CUSTODIAL PASTURE

Custodial Pasture	Condition Rating	Cattle and Domestic Horses	Sheep	Wild Horses	Pronghorn Antelope	Mule Deer	Elk	Moose
C-1	Good	0	0	0	260	183	106	0
	Fair	183	51	183	0	77	0	0
	Poor	77	209	77	0	0	0	0
	Marginal Use	0	0	0	0	0	154	260
C-2	Good	0	0	0	105	105	105	0
	Fair	0	0	0	0	0	0	0
	Poor	105	105	105	0	0	0	0
	Marginal Use	0	0	0	0	0	0	105
C-3	Good	0	0	0	0	189	113	0
	Fair	215	215	0	215	26	102	0
	Poor	0	0	0	0	0	0	0
	Marginal Use	0	0	215	0	0	0	215
C-4	Good	0	0	0	0	90	90	0
	Fair	65	90	0	90	0	0	0
	Poor	25	0	0	0	0	0	0
	Marginal Use	0	0	90	0	0	0	90
C-5	Good	476	0	476	476	476	0	0
	Fair	0	476	0	0	0	0	0
	Poor	0	0	0	0	0	0	0
	Marginal Use	0	0	0	0	0	476	476
C-6	Good	0	0	0	665	715	0	0
	Fair	561	715	561	50	0	0	0
	Poor	154	0	154	0	0	0	0
	Marginal Use	0	0	0	0	0	715	715
C-7	Good	0	0	0	127	0	0	0
	Fair	570	570	570	443	570	0	0
	Poor	0	0	0	0	0	0	0
	Marginal Use	0	0	0	0	0	570	570
C-8	Good	408	0	0	408	408	0	77
	Fair	0	408	0	0	0	0	331
	Poor	0	0	0	0	0	0	0
	Marginal Use	0	0	408	0	0	408	0
C-9	Good	673	673	673	598	673	673	169
	Fair	0	0	0	75	0	0	26
	Poor	0	0	0	0	0	0	478
	Marginal Use	0	0	0	0	0	0	0
C-10	Good	733	733	733	0	709	582	154
	Fair	0	0	0	733	24	151	193
	Poor	0	0	0	0	0	0	386
	Marginal Use	0	0	0	0	0	0	0
C-11	Good	0	0	0	915	915	0	77
	Fair	915	915	0	0	0	0	838
	Poor	0	0	0	0	0	0	0
	Marginal Use	0	0	915	0	0	915	0
C-12	Good	0	103	0	0	0	26	0
	Fair	190	87	0	190	190	164	190
	Poor	0	0	0	0	0	0	0
	Marginal Use	0	0	190	0	0	0	0
C-13	Good	0	100	0	0	0	74	0
	Fair	100	0	0	100	100	26	100
	Poor	0	0	0	0	0	0	0
	Marginal Use	0	0	100	0	0	0	0
C-14	Good	0	0	0	0	0	0	0
	Fair	25	25	25	25	0	0	0
	Poor	0	0	0	0	25	0	0
	Marginal Use	0	0	0	0	0	25	25
C-15	Good	0	204	0	488	717	0	435
	Fair	1,998	2,562	1,998	1,030	1,614	0	1,557
	Poor	768	0	768	1,248	435	0	773
	Marginal Use	0	0	0	0	0	2,766	0
C-16	Good	0	0	0	0	0	0	162
	Fair	99	235	99	26	157	0	26
	Poor	136	0	136	209	78	0	47
	Marginal Use	0	0	0	0	0	235	0
C-17	Good	0	0	0	173	545	154	429
	Fair	326	545	326	372	0	141	116
	Poor	219	0	219	0	0	0	0
	Marginal Use	0	0	0	0	0	250	0
C-18	Good	0	0	0	184	0	0	179
	Fair	260	260	260	76	260	260	81
	Poor	0	0	0	0	0	0	0
	Marginal Use	0	0	0	0	0	0	0
C-19	Good	0	52	0	293	191	191	26
	Fair	0	343	0	0	204	204	369
	Poor	395	0	395	102	0	0	0
	Marginal Use	0	0	0	0	0	0	0

TABLE 2-77 (Continued)

PREDICTED FUTURE RANGE CONDITION IN ACRES FOR MAJOR ANIMAL SPECIES BY ALLOTMENT AND CUSTODIAL PASTURE

Custodial Pasture	Condition Rating	Cattle and Domestic Horses	Sheep	Wild Horses	Pronghorn Antelope	Mule Deer	Elk	**Moose**
C-20	Good	0	0	0	55	0	55	**55**
	Fair	0	55	0	0	55	0	**0**
	Poor	55	0	55	0	0	0	**0**
	Marginal Use	0	0	0	0	0	0	**0**
C-21	Good	0	0	0	879	1,975	98	**905**
	Fair	1,975	1,514	1,975	1,096	0	128	**1,070**
	Poor	0	461	0	0	0	0	**0**
	Marginal Use	0	0	0	C	0	1,749	**0**
C-22	Good	0	0	0	255	255	0	**0**
	Fair	255	255	0	0	0	0	**0**
	Poor	0	0	0	0	0	0	**0**
	Marginal Use	0	0	255	0	0	255	**255**
C-23	Good	0	0	0	350	350	0	**0**
	Fair	350	350	0	0	0	0	**0**
	Poor	0	0	0	0	0	0	**0**
	Marginal Use	0	0	350	0	0	350	**350**
C-24	Good	0	0	0	845	1,354	0	**1,653**
	Fair	827	2,242	0	1,397	888	0	**538**
	Poor	1,415	0	0	0	0	0	**51**
	Marginal Use	0	0	2,242	0	0	2,242	**0**
C-25	Good	0	0	0	2,519	3,210	3,133	**1,675**
	Fair	0	3,210	0	691	0	0	**1,535**
	Poor	3,210	0	0	0	0	0	**0**
	Marginal Use	0	0	3,210	0	0	77	**0**
C-26	Good	0	0	0	666	2,144	2,144	**77**
	Fair	0	2,630	0	1,964	486	128	**2,399**
	Poor	2,630	0	0	128	0	0	**154**
	Marginal Use	0	0	2,630	0	0	358	**0**
C-27	Good	0	0	0	1,056	179	354	**706**
	Fair	801	1,210	0	52	954	517	**402**
	Poor	409	0	0	102	77	339	**102**
	Marginal Use	0	0	1,210	0	0	0	**0**
C-28	Good	0	0	0	854	778	0	**880**
	Fair	0	880	0	0	102	0	**0**
	Poor	880	0	0	26	0	0	**0**
	Marginal Use	0	0	880	0	0	880	**0**
C-29	Good	0	760	0	760	760	760	**760**
	Fair	0	0	0	0	0	0	**0**
	Poor	760	0	0	0	0	0	**0**
	Marginal Use	0	0	760	0	0	0	**0**
C-30	Good	0	4,078	0	4,360	4,334	1,746	**3,362**
	Fair	4,130	282	0	0	26	0	**0**
	Poor	230	0	0	0	0	0	**0**
	Marginal Use	0	0	4,360	0	0	2,614	**998**
C-31	Good	0	0	0	0	1,352	0	**1,073**
	Fair	0	0	0	741	0	0	**0**
	Poor	1,685	1,685	1,685	944	333	0	**612**
	Marginal Use	0	0	0	0	0	1,685	**0**
C-32	Good	0	0	0	0	0	0	**220**
	Fair	0	220	0	220	220	0	**0**
	Poor	220	0	220	0	0	0	**0**
	Marginal Use	0	0	0	0	0	220	**0**
C-33	Good	0	0	0	90	90	0	**39**
	Fair	90	0	90	0	0	0	**51**
	Poor	0	0	0	0	0	0	**0**
	Marginal Use	0	90	0	0	0	90	**0**
TOTAL CUSTODIAL PASTURE ACRES*	Good	2,295	6,706	1,885	17,380	22,697	10,332	**13,110**
	Fair	17,732	20,342	6,086	9,587	5,953	1,897	**9,533**
	Poor	9,571	2,460	3,814	1,631	948	339	**2,897**
	Marginal Use	0	90	17,813	0	0	17,030	**4,058**
		29,598	29,598	29,598	29,598	29,598	29,598	**29,598**
AREA TOTAL**	Good	340,702	261,712	321,674	1,288,205	764,330	291,378	**125,994**
	Fair	1,142,763	1,562,217	953,541	607,243	274,556	160,276	**98,475**
	Poor	513,865	173,321	435,819	100,882	49,703	28,508	**36,516**
	Marginal Use	0	90	286,296	0	908,741	1,517,168	**1,746,345**
		1,997,330	1,997,330	1,997,330	1,997,330	1,997,330	1,997,330	**1,997,330**

* Total acres differ from those of Chapter 1. Figures above are actual acres, while those in Chapter 1 are rounded off to the nearest 5 acres. (See APPENDIX 1C for further details).

** Does not include Palmer Draw wildlife area (970 acres) and Federal withdrawals (1,750 acres).

nounced, resulting in a decrease in the stability of aquatic stream environments.

The majority of aquatic habitat and fisheries resources probably would exist in reservoirs because biologically the streams would become little more than natural canals for the transport of remaining water flows to the next downstream user.

Flow depletion of the Green River within the bounds of the Little Colorado Compact could lead to the establishment of a fair to marginal warm water fishery in place of the trout fishery existing today.

WILD HORSES

Wild horses would be managed in accordance with the Wild, Free-Roaming Horse and Burro Act of 1971 and under the Little Colorado and Continental Peak Wild Horse Unit Management Plans. These plans call for an average number of horses to be maintained. When a specified maximum number is reached, the horses would be gathered and reduced to a minimum number. The minimum/maximum numbers proposed for the Little Colorado Unit are 100/200, and for the Continental Peak Unit they are 500/750; the average numbers are 150 and 650, respectively. Adequate forage reservations would be made for these horses.

PALEONTOLOGICAL AND CULTURAL RESOURCES

The paleontological and cultural resources in the Sandy area are declining due to vandalism, destruction by mineral exploration activities (road and well site construction), geological erosion, trampling by livestock, and off-road vehicle (ORV) damage. In the next 20 years virtually all diagnostic surface artifacts would be removed and severe impacts would begin upon stratified sites. Some trespass would continue to occur upon historic trails, thereby decreasing the number of miles of undisturbed ruts.

VISUAL RESOURCES

The visual quality of the Sandy area would change with additional use. Even with site planning for minimum visual disturbance, a continued loss of natural character would be anticipated as the area is encroached upon by activities such as oil and gas development. Human use thus would become more evident and the natural qualities of the landscape would be modified as a result of the high economic value of the resources, primarily minerals, within the area.

RECREATION

Recreation visitor use would be expected to increase by 24% overall between 1970 and 1985. The annual increase for all activities would be expected to be about 3%, based on the Wyoming State Outdoor Recreation Plan (SCORP) projections by activity by county and BLM unit resource analysis estimates (BLM 1975). Future use would be expected to follow the established patterns; demand would increase primarily at the reservoirs, in the Wind River Front area, and along major rivers and streams.

Increased use would put stress on the existing environment and emphasize the effects of other competitive values. As nonrecreation uses of the Sandy area increase, the recreational value of some sites would decrease. The remaining sites would have an increase in use that would overtax their recreational potential and thus lead to a reduction in their quality.

LIVESTOCK GRAZING

The existing temporary conversions from sheep to cattle would have been made permanent and adjusted as necessary based on range condition and trend studies. The conversion ratio would be based on factors such as whether it is an individual or common use allotment, the suitability of existing water developments, and whether fencing is necessary and can be accomplished.

There would be less regular nonuse taken since the amount currently allowed is temporary until this ES is completed. When the range is in satisfactory condition and a licensee is granted nonuse for reasons other than range conservation and protection, other applicants may be issued temporary nonrenewable licenses to utilize the forage available.

MINERAL RESOURCES

Drilling activity is expected to remain constant throughout the next 23 years in the Sandy area (per. comm., Fraher 1977), although discoveries of oil and gas could increase significantly the number of wells drilled in the area (per. comm., Basko 1978). Based on current activity trends, oil and gas activity in the Sandy area for the next 23 years would result in 1,150 to 1,350 wells; 1,875 to 2,010 acres of disturbed lands; 1,150 to 1,350 miles of new roads; and 4,600 to 5,000 miles of seismic lines.

Development of uranium deposits probably would occur along the Wind River Front and the Great Divide Basin in 10 to 15 years. Gravels along the Big Sandy in the vicinity of Farson most likely would be used extensively in 20 years.

FORESTRY

In 20 to 25 years, the areas which are now being thinned would have trees approaching saw timber size.

Areas now being cut for fuelwood would have young trees about 5 to 15 feet high.

An intensive forest management program would be initiated within 25 years to help alleviate the problems now occurring. This program would involve the four main practices:

1. Continued thinning of overstocked lodgepole pine stands of commercial size trees.
2. Prescribed burning of overstocked stands of pre-commercial size trees.
3. Clearcutting of all stands infested with mistletoe.
4. Increasing volume of annual fuelwood sales 200,000 to 300,000 board feet to clear dead material from the forest.

LAND USE PLANS, CONTROLS, AND CONSTRAINTS

Based on trends toward more effective planning on both the State and Federal levels, it can be assumed that all jurisdictions would develop more sophisticated plans in the future. However, since the function of planning is to provide for the orderly, rational achievement of goals and objectives that grow out of legislative and administrative policies, the specific goals, objectives, and programs of long-range future plans can only be anticipated in the most general way. For example, it can be assumed that a national energy policy will eventually be adopted, but the specific implications of such a policy for the Sandy area cannot be anticipated at this time.

It can be assumed that land use plans would be prepared in the near future by all local jurisdictions mentioned in the existing environment section. The Wyoming State Land Use Planning Act of 1975 (W.S. 9-850) mandates that within twelve months of the adoption of statewide guidelines, all governments will develop a land use plan. Statewide guidelines were issued in July 1976. Some of the more salient goals that have been identified for consideration which could have implications for BLM in the Sandy area are as follows (Wyoming State Land Use Commission 1976):

1. To plan for the continuing use of agricultural-rural lands and for the potential of change in the use of those lands.
2. To plan land use consistent with the orderly development, use, and conservation of renewable and non-renewable natural resources.
3. To conserve and develop scenic, historic, and recreational resources for the benefit of present and future generations.
4. To provide for a cooperative process of land use planning with other governmental agencies.

Exactly how these goals would affect the Sandy area would not be known at least until the local planning processes are underway. The goals do suggest, however, general areas in which consistency would be desirable.

The other jurisdictions in the Sandy area have no immediate plans to alter their management functions.

SOCIOECONOMIC CONDITIONS

Population

Population within the region is anticipated to grow in the future (TABLE 2-78, 2-79, and 2-80). Increases in population would largely result from employment in the increased mineral and allied activity throughout the region. Sweetwater County alone is expected to increase to a total population of 64,131 by 1990 (THK Associates, Inc. 1976), or an increase of 41.5% over 1974 population (TABLE 2-78).

Lincoln and Uinta Counties are expected to have high growth rates (TABLE 2-79), while Sublette County would have only a 2% per year growth rate. Since most growth is anticipated to occur in mineral related fields, rural and agriculturally based populations will decrease as a percentage of total population.

Income

If recent trends continue, farm income will continue to decline as a percent of total regional income. The actual value of farm income will probably continue to fluctuate on a yearly basis as it has since 1950 (Wyoming Agricultural Statistics 1976; p. 10). As indicated on TABLES 2-24 and 2-76, the AUMs available to livestock in the Sandy area would decline by 24,737. This would result in the loss of approximately $523,806 per year total income to the four-state region in 23 years (Current AUM value and income multiplier used; inflation not considered). Net rancher income would be reduced approximately $45,333 (assuming same ratio used in Chapter 2 Existing Socioeconomic Conditions for reducing direct income to personal income). Visitor use in the Sandy area is expected to increase by 3% per year for all activities (see Recreation section). If current recreation values are used, there would be a total income increase of approximately $529,199 per year in the region (assumes current multiplier; inflation not considered). Anticipated construction projects would result in $50,526 per year additional income for seven years required for the building of a fence between the Sandy area and the checkerboard lands (see Glossary).

Employment

Employment projections for the area as a whole are not currently available; however, TABLES 2-80 and 2-81 provide an indication of future trends in the region. Lincoln and Uinta Counties anticipate a 61.8% and 22% increase in employment between 1975 and 1985, respectively. Even local planners are hesitant to project beyond this because of the extreme uncertainty of mineral and power producers in the area. Sublette County appears to be in a stabilized situation projecting a modest increase in employment (2%) primarily influenced by a response to

TABLE 2-78

ESTIMATE OF 1990 POPULATION IN SWEETWATER COUNTY

	1976 Population (EST.)	Percent of County Population	New Growth 1976-90	Percent of New Growth	New Total Population 1990	Percent of 1990 Population
Granger	240	0.63	455	1.76	695	1.08
Little America	115	0.30	187	0.72	302	0.47
Green River Area	11,435	29.85	8,329	32.26	19,764	30.82
Green River	11,000	28.71	8,049	31.17	19,049	29.72
Jamestown	435	1.14	280	1.09	715	1.10
Rock Springs Area	23,591	61.58	12,795	49.55	36,386	56.74
Rock Springs	21,232	55.42	11,279	43.68	32,511	50.69
Log Inn	634	1.65	332	1.29	966	1.51
Starvation Flats	819	2.14	458	1.77	1,277	1.99
Reliance	906	2.37	726	2.81	1,632	2.55
Eden-Farson Area	210	0.55	23	0.09	233	0.36
Eden	62	.16	7	0.03	69	0.11
Farson	148	.39	16	0.06	164	0.25
South Superior	648	1.69	471	1.82	1,119	1.74
Point of Rocks	160	0.42	284	1.11	444	.69
Wamsutter	297	0.78	3,277	12.69	3,574	5.58
Remainder of County	1,614	4.21	0	0	1,614	2.52
SWEETWATER COUNTY	38,310	100.0	25,821	100.00	64,131	100.0
Rawlins	11,000		2,980		13,980	

Source: Unpublished report by THK Associates, Inc., November 18, 1976.

TABLE 2-79

ROCK SPRINGS EMPLOYMENT AND POPULATION PROJECTIONS 1975-1995

	1975	1976	1977	1978	1979	1980	1985	1990	1995
Mining	2,240	2,551	2,584	2,636	2,714	2,793	3,259	3,619	4,013
Construction	1,962	1,825	1,770	1,683	1,579	1,461	1,222	1,365	1,504
Manufacturing	298	304	311	321	331	341	405	464	522
Basic Employment	4,500	4,680	4,665	4,640	4,624	4,595	4,886	5,448	6,039
Transportation, Communications, and Utilities	521	540	579	604	634	671	825	966	1,168
Wholesale Trade	528	542	585	612	647	677	825	944	1,091
Retail Trade	1,814	1,890	2,026	2,133	2,236	2,351	2,846	3,281	3,787
Banks and Savings & Loan Associations	152	157	165	178	185	194	247	301	365
Other Offices (1)	580	621	687	754	815	880	1,175	1,478	1,839
Other Commercial (2)	775	794	852	899	939	989	1,195	1,361	1,551
Agriculture	100	100	100	100	100	100	100	100	100
Government	398	419	457	490	524	553	729	911	1,070
All Other (3)	698	732	790	832	882	928	1,176	1,446	1,787
Service Employment	5,566	5,795	6,241	6,602	6,962	7,343	9,118	10,788	12,758
Total Employment	10,066	10,475	10,906	11,242	11,586	11,938	14,004	16,236	18,797
Ratio of Rock Springs to Sweetwater County Employment	.60	.59	.585	.58	.575	.57	.55	.53	.51
Population	20,000	21,232	22,333	23,258	24,206	25,222	30,577	36,619	43,878
Ratio of Rock Springs to Sweetwater County Population	.588	.58	.575	.57	.565	.56	.54	.52	.50
Ratio of Rock Springs Employment to Population	.503	.493	.488	.483	.479	.473	.460	.443	.428

(1) "Other Offices" include insurance, real estate, business and repair services, health services (except hospitals, and legal, engineering, and miscellaneous professional services.

(2) "Other Commercial" includes entertainment, hospitals, and other personal services.

(3) "All Other" includes private houshold services, education, welfare, religious, and nonprofit membership organizations.

Source: "An Update of the Comprehensive Plan for Rock Springs, Wyoming, August 1975," John Dempsey & Associates, Englewood, Colorado.

TABLE 2-80

POPULATION, EMPLOYMENT, AND INCOME PROJECTIONS FOR LINCOLN AND UINTA COUNTIES

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Total Population											
Lincoln County	9,318	9,363	9,758	10,681	10,436	11,600	11,719	12,915	13,351	14,184	13,663
Uinta County	9,669	10,018	10,544	10,555	10,562	10,586	10,401	10,897	11,274	11,333	11,193
Total Employment											
Lincoln County	3,316	3,365	3,565	3,998	3,910	4,437	4,501	5,038	5,224	5,595	5,364
Uinta County	3,846	4,028	4,286	4,312	4,331	4,349	4,278	4,518	4,702	4,738	4,693
Personal Income ($000's)*											
Lincoln County	47,871	49,054	52,308	58,302	58,172	66,394	68,437	77,168	81,205	88,119	86,409
Uinta County	39,569	42,586	46,574	47,853	49,238	50,683	51,069	55,362	59,025	60,872	61,748
Per Capita Income*											
Lincoln County	5,137	5,239	5,361	5,458	5,574	5,724	5,840	5,975	6,082	6,213	6,324
Uinta County	4,092	4,251	4,417	4,534	4,662	4,788	4,910	5,080	5,235	5,371	5,517

*1973 Constant Dollars

Source: Forecasting Employment and Population in Lincoln and Uinta Counties, Economic Research Unit, Wyoming Department of Economic Planning and Development, October 1976.

a growing seasonal migration pattern (per. comm., Janet Montgomery, November 23, 1976). TABLE 2-81 shows Sweetwater County projections. Since this county accounts for approximately 61% of total regional employment and since growth in the region would be anticipated in basically the same sectors as in Sweetwater County, percentages by broad sector should be representative for this entire area. The growth trend in this county beyond 1985 can be estimated from TABLE 2-78 and TABLE 2-79 since Rock Springs and Green River constitute about 84.1% of total population.

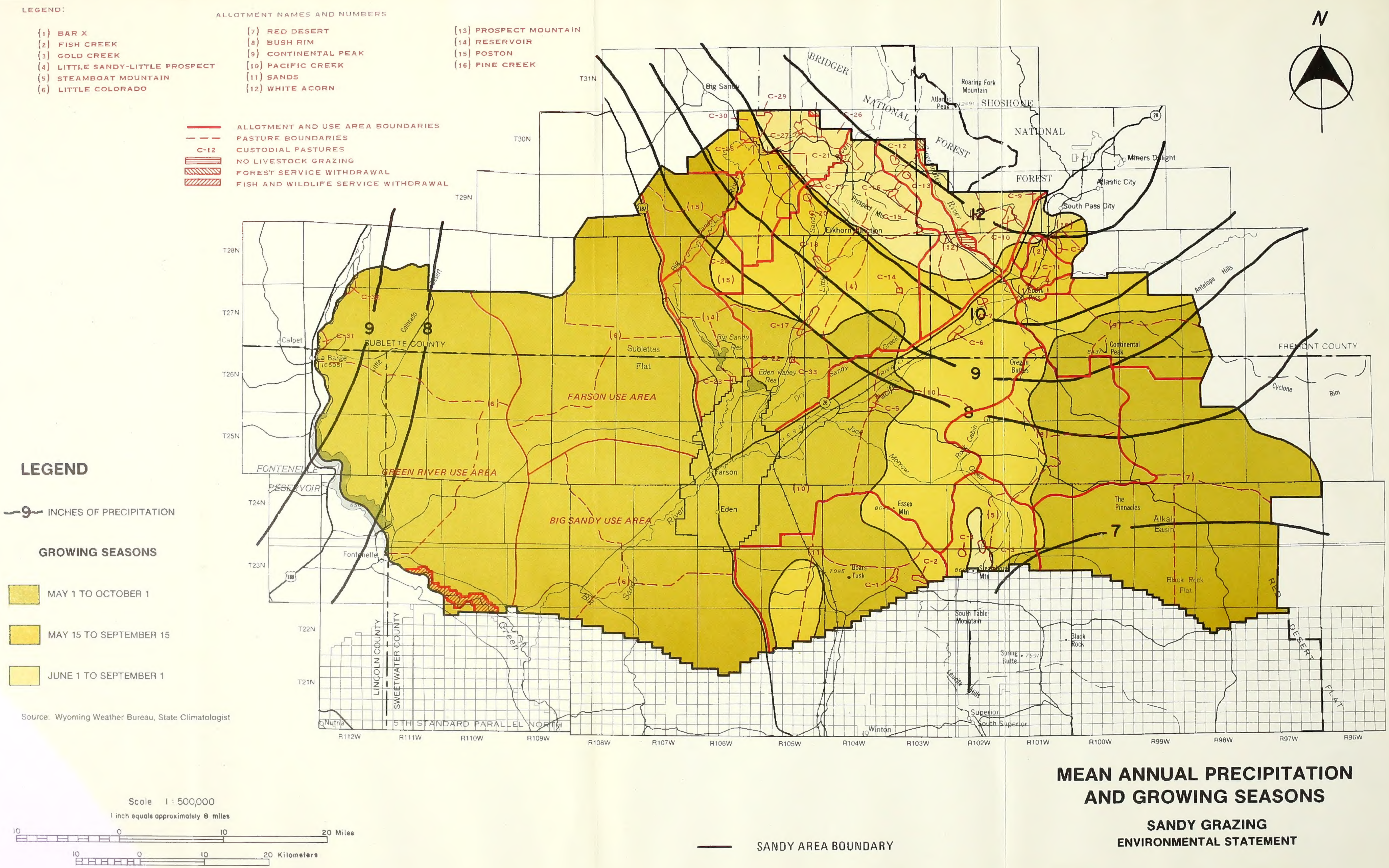
TABLE 2-81

ESTIMATE OF SWEETWATER COUNTY BASIC EMPLOYMENT BY MAJOR SOURCE, 1975 TO 1985

Basic Employment Source	Number Employed and Percent of Total Basic Employment by Year																					
	1975	%	1976	%	1977	%	1978	%	1979	%	1980	%	1981	%	1982	%	1983	%	1984	%	1985	%
Trona Mining	2,700	47.5	3,000	48.4	3,300	48.2	3,550	48.3	3,800	48.1	4,000	47.6	4,200	47.5	4,400	45.6	4,600	45.3	4,800	44.0	5,000	43.9
Coal Mining	20	0.4	100	1.6	280	4.1	350	4.7	500	6.3	650	7.7	650	7.3	800	8.3	800	7.9	950	8.7	950	8.3
Oil & Gas 1/	600	10.5	700	11.3	800	11.6	900	12.2	1,000	12.7	1,100	13.1	1,100	12.4	1,200	12.4	1,200	11.8	1,300	11.9	1,300	11.4
Jim Bridger 2/	250	4.4	340	5.5	350	5.1	375	5.1	420	5.3	420	5.0	420	4.7	420	4.4	420	4.1	420	3.8	420	3.7
Railroads	370	6.5	350	5.6	350	5.1	350	4.8	350	4.4	350	4.2	350	3.9	350	3.6	350	3.4	350	3.2	350	3.1
Other basic 3/	1,750	30.8	1,710	27.6	1,770	25.8	1,825	24.8	1,830	23.2	1,880	22.4	1,930	21.8	1,980	20.5	2,030	20.0	2,080	19.1	2,130	18.7
New energy-related activity 4/	--		--		--		--		--		--		200	2.3	500	5.2	750	7.4	1,000	9.2	1,250	11.0
TOTAL BASIC	5,690		6,200		6,850		7,350		7,900		8,400		8,850		9,650		10,150		10,900		11,400	

1/ Includes exploration, supporting services, and a portion of Mountain Fuel Supply (natural gas distributors).
2/ Includes coal mine.
3/ Includes agriculture, manufacturing, and that portion of trade, services, and government involved in basic economic activity.
4/ Possible oil shale plant or coal gasification plant.

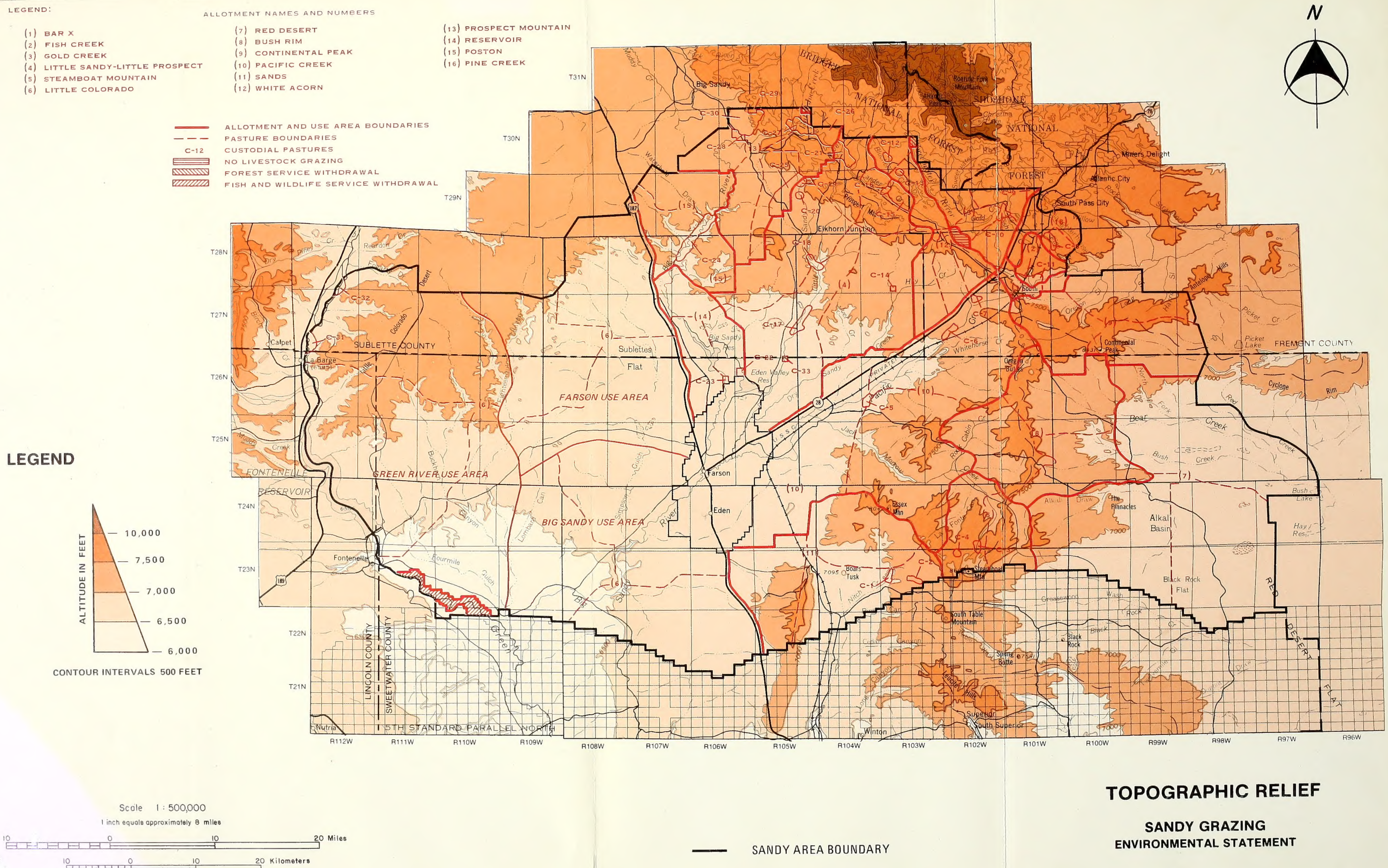
Source: An Analysis of Jim Bridger 4 Power Plant Impacts, Bickert, Browne, Coddington and Associates, Inc., Denver, Colorado, 1974.



MEAN ANNUAL PRECIPITATION AND GROWING SEASONS

SANDY GRAZING ENVIRONMENTAL STATEMENT

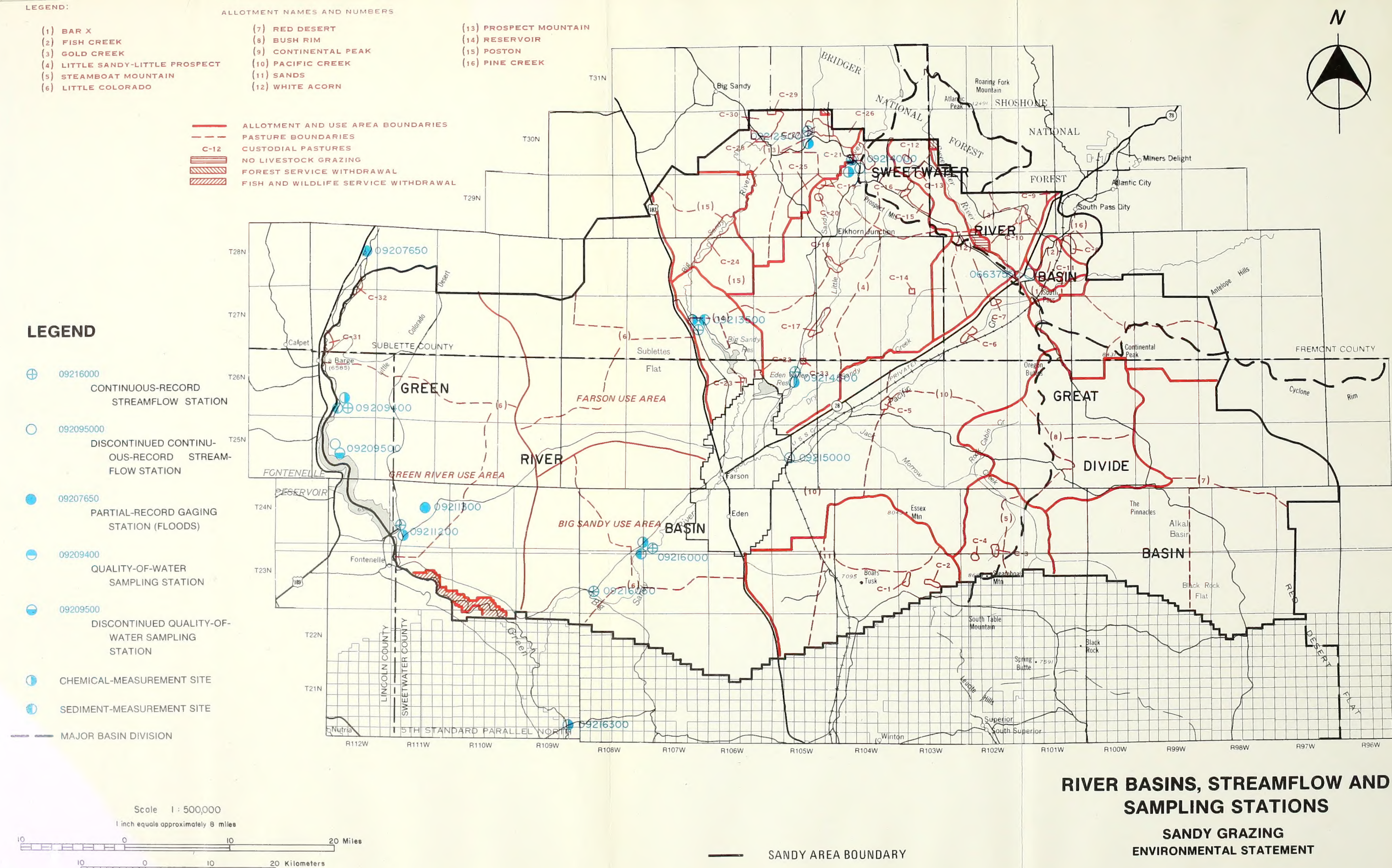
MAP 2-1



TOPOGRAPHIC RELIEF

SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 2-2



RIVER BASINS, STREAMFLOW AND SAMPLING STATIONS

SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 2-5

LEGEND:

ALLOTMENT NAMES AND NUMBERS

(1) BAR X
(2) FISH CREEK
(3) GOLD CREEK
(4) LITTLE SANDY-LITTLE PROSPECT
(5) STEAMBOAT MOUNTAIN
(6) LITTLE COLORADO
(7) RED DESERT
(8) BUSH RIM
(9) CONTINENTAL PEAK
(10) PACIFIC CREEK
(11) SANDS
(12) WHITE ACORN
(13) PROSPECT MOUNTAIN
(14) RESERVOIR
(15) POSTON
(16) PINE CREEK

ALLOTMENT AND USE AREA BOUNDARIES
PASTURE BOUNDARIES
C-12 CUSTODIAL PASTURES
NO LIVESTOCK GRAZING
FOREST SERVICE WITHDRAWAL
FISH AND WILDLIFE SERVICE WITHDRAWAL

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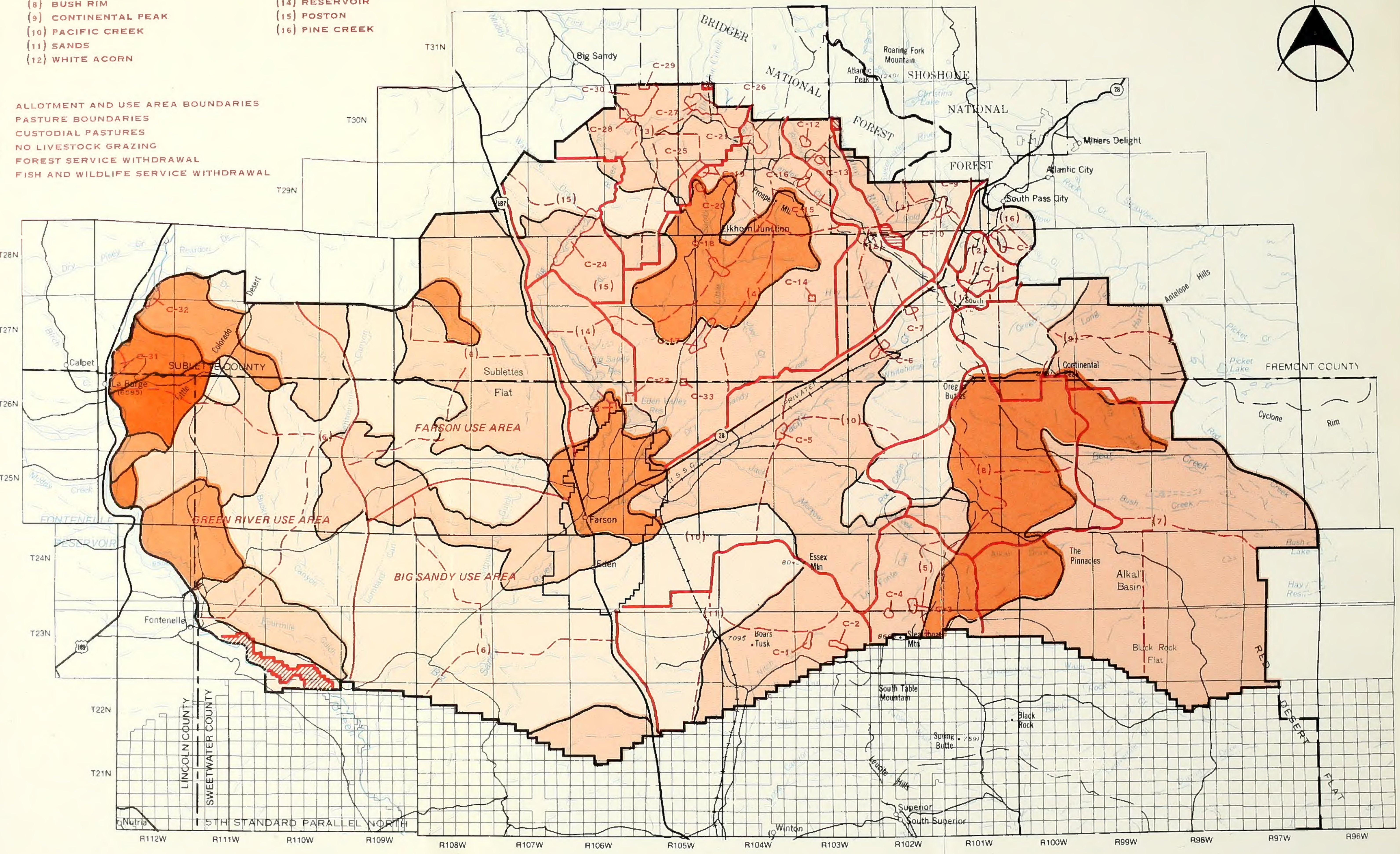


LEGEND

SEDIMENT YIELDS (TONS PER SQUARE MILE PER YEAR)

- 360 TO 540
- 540 TO 720
- 720 TO 1080
- 1080 TO 1440
- 1440 TO 1800

Scale 1 : 500,000
1 inch equals approximately 8 miles

10 0 10 20 Miles

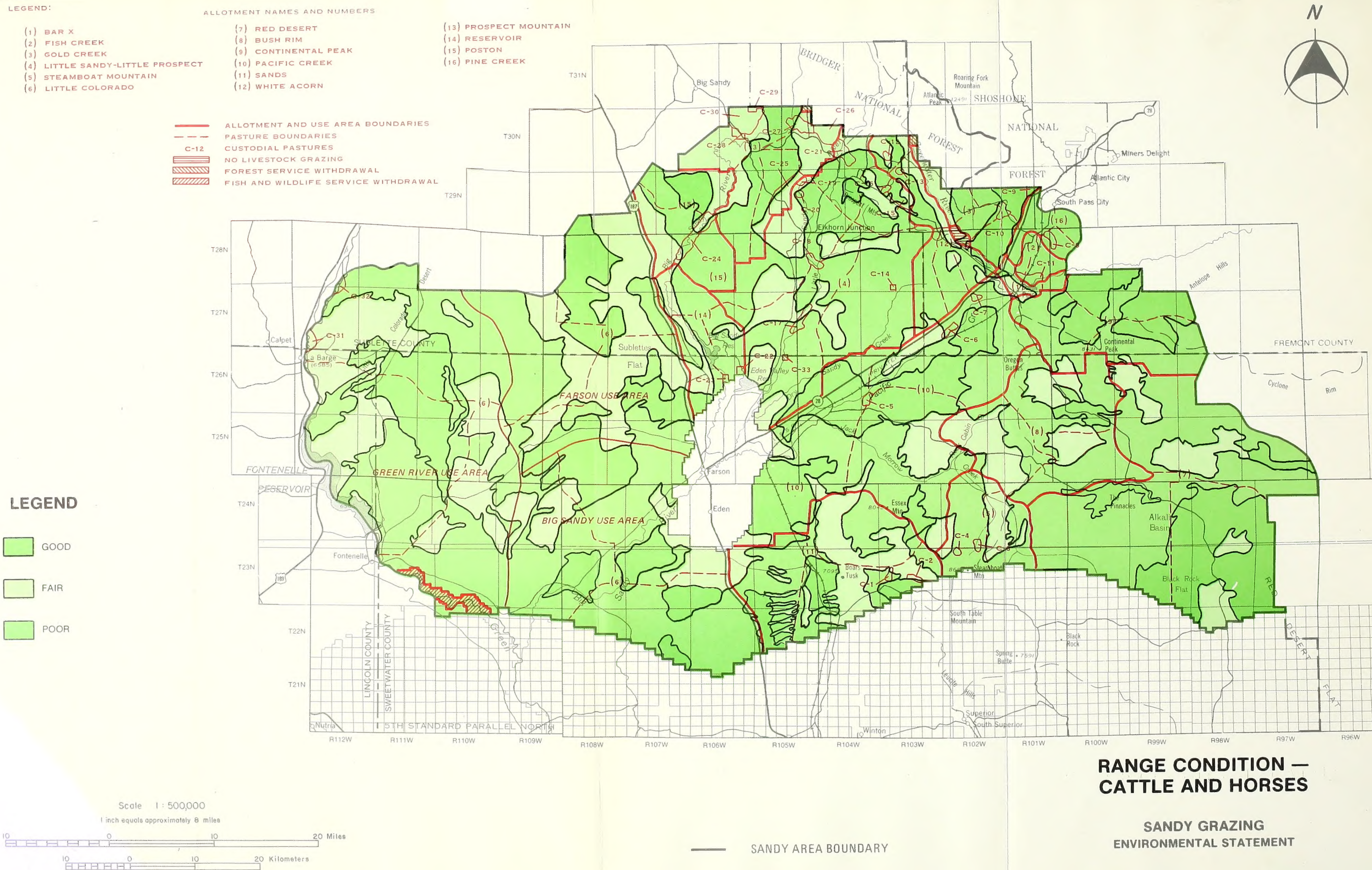
10 0 10 20 Kilometers

SANDY AREA BOUNDARY

ANNUAL SEDIMENT YIELDS

SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 2-6



RANGE CONDITION — CATTLE AND HORSES

SANDY GRAZING ENVIRONMENTAL STATEMENT

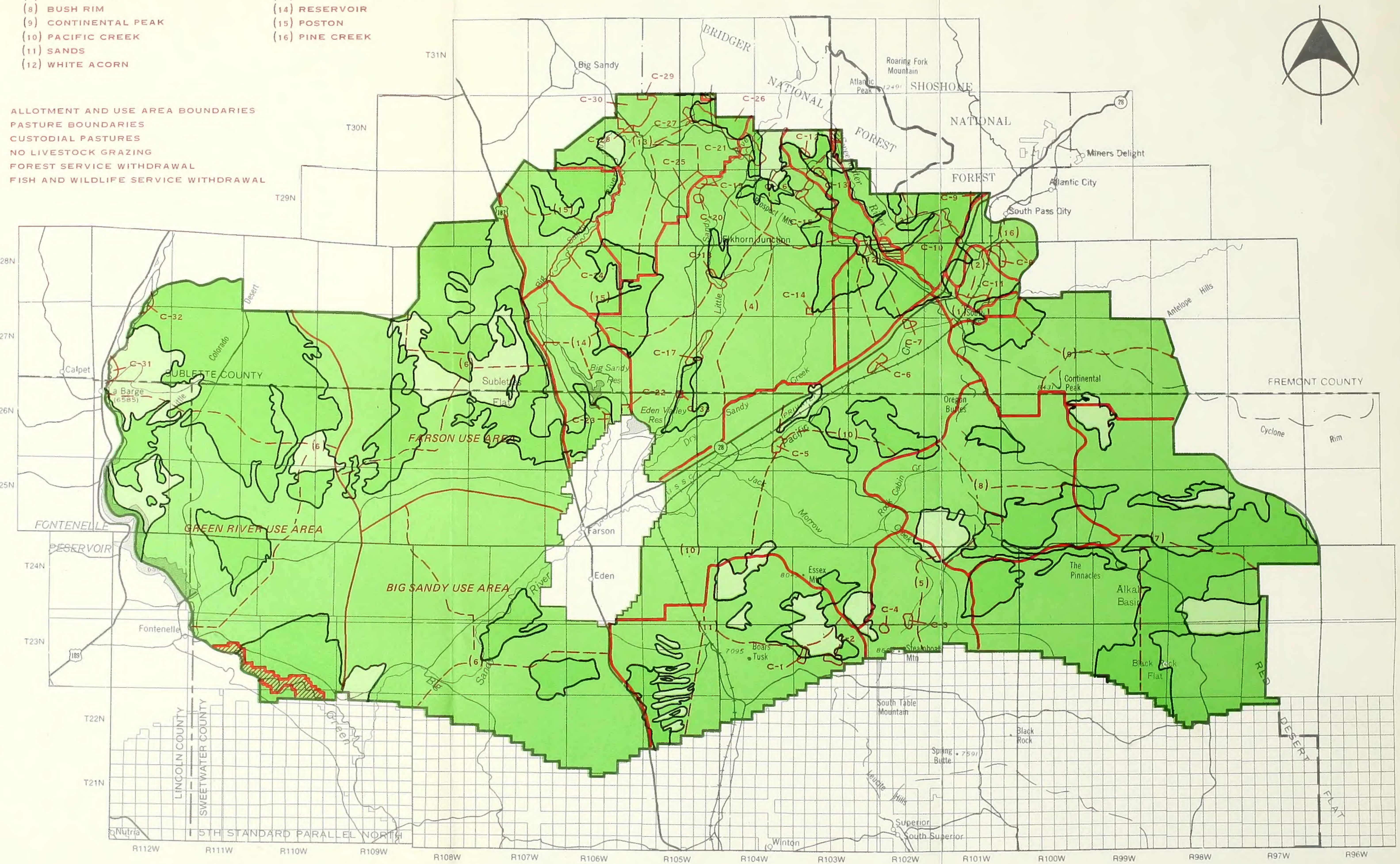
MAP 2-9

LEGEND:

ALLOTMENT NAMES AND NUMBERS

(1) BAR X
(2) FISH CREEK
(3) GOLD CREEK
(4) LITTLE SANDY-LITTLE PROSPECT
(5) STEAMBOAT MOUNTAIN
(6) LITTLE COLORADO
(7) RED DESERT
(8) BUSH RIM
(9) CONTINENTAL PEAK
(10) PACIFIC CREEK
(11) SANDS
(12) WHITE ACORN
(13) PROSPECT MOUNTAIN
(14) RESERVOIR
(15) POSTON
(16) PINE CREEK

ALLOTMENT AND USE AREA BOUNDARIES
PASTURE BOUNDARIES
C-12 CUSTODIAL PASTURES
NO LIVESTOCK GRAZING
FOREST SERVICE WITHDRAWAL
FISH AND WILDLIFE SERVICE WITHDRAWAL



LEGEND

GOOD

FAIR

POOR

Scale 1 : 500,000

1 inch equals approximately 8 miles

10 0 10 20 Miles

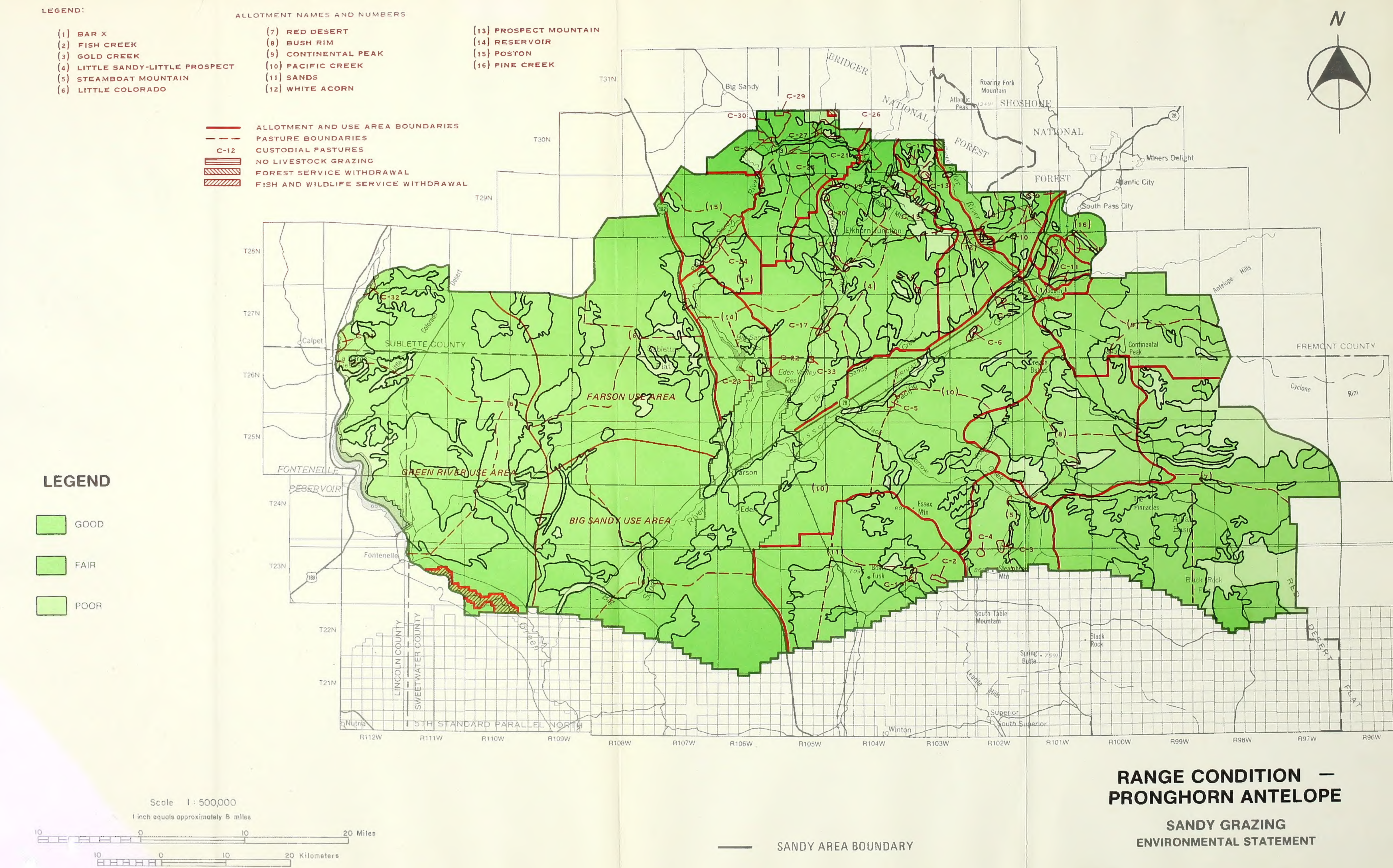
10 0 10 20 Kilometers

SANDY AREA BOUNDARY

RANGE CONDITION - SHEEP

SANDY GRAZING ENVIRONMENTAL STATEMENT

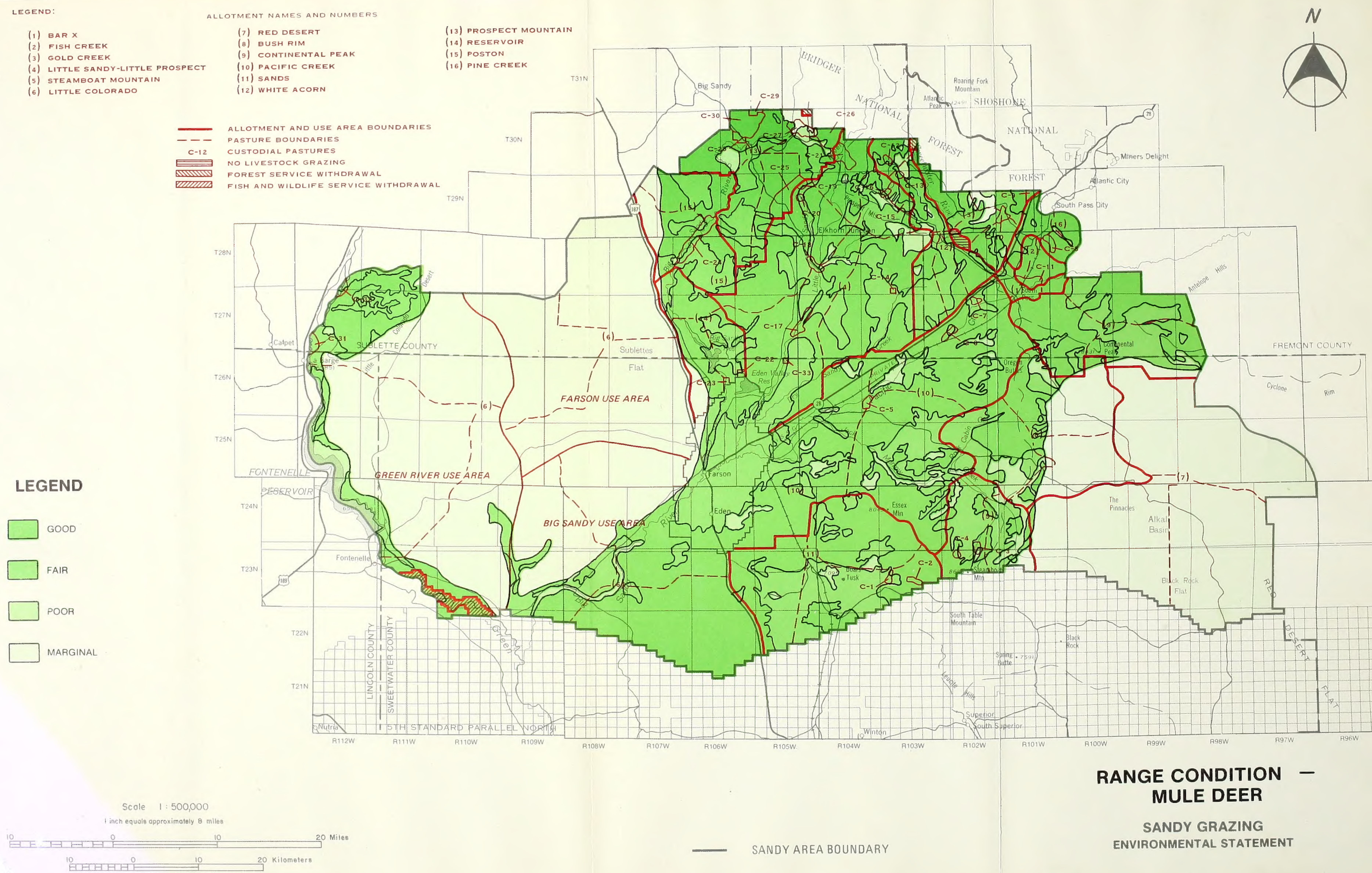
MAP 2-10



RANGE CONDITION — PRONGHORN ANTELOPE

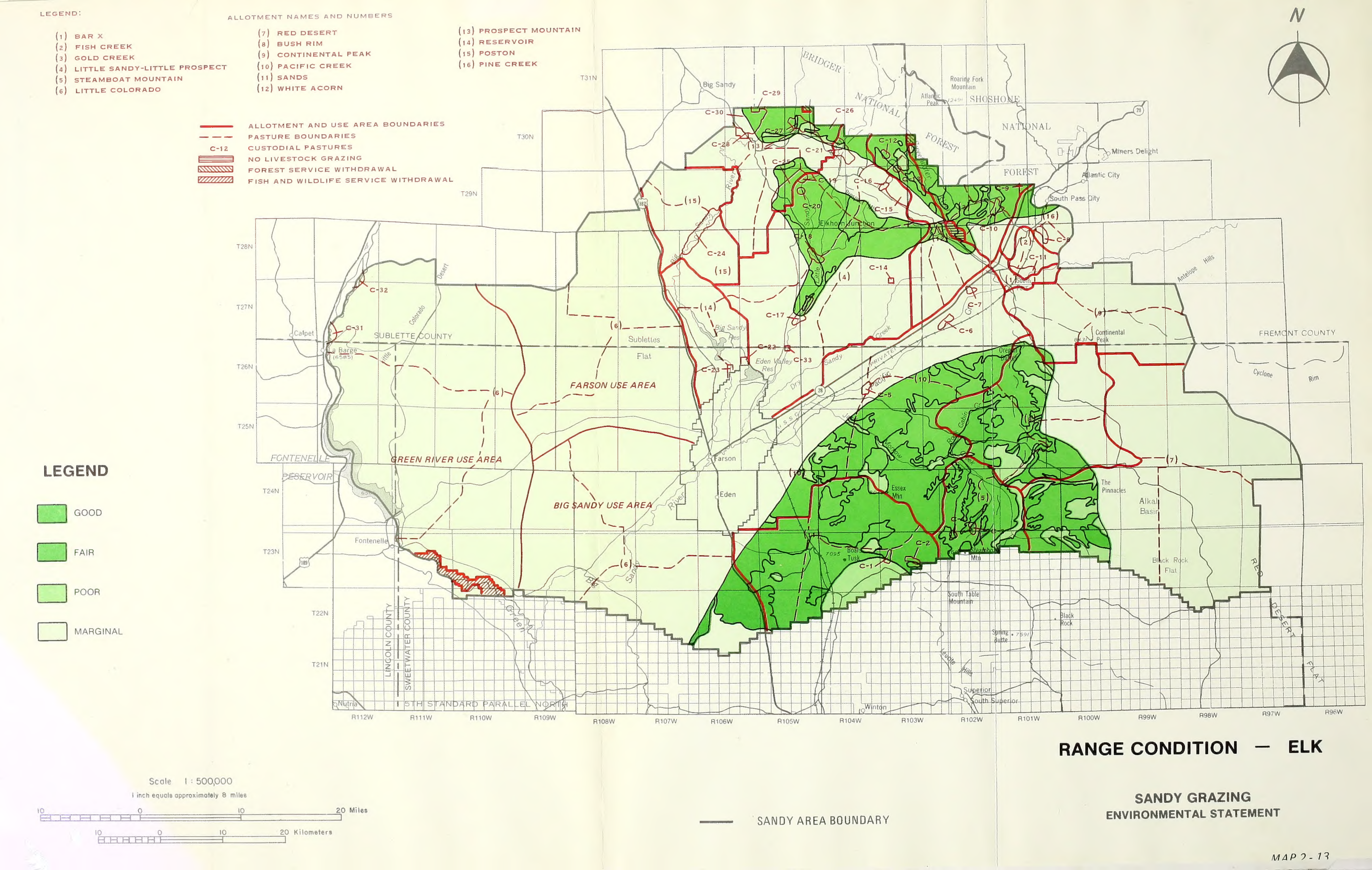
SANDY GRAZING ENVIRONMENTAL STATEMENT

MAP 2-11



RANGE CONDITION — MULE DEER

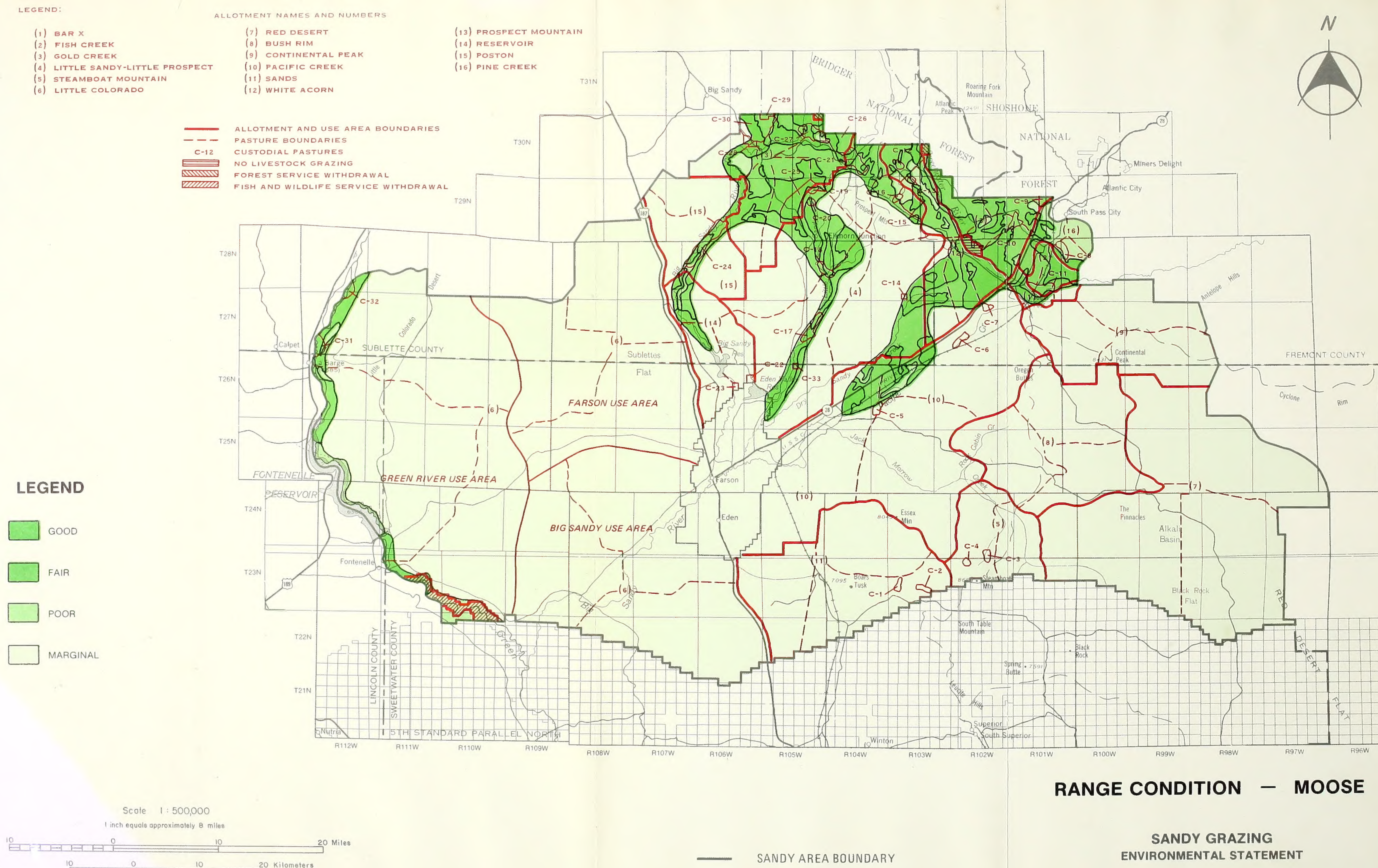
SANDY GRAZING ENVIRONMENTAL STATEMENT



RANGE CONDITION — ELK

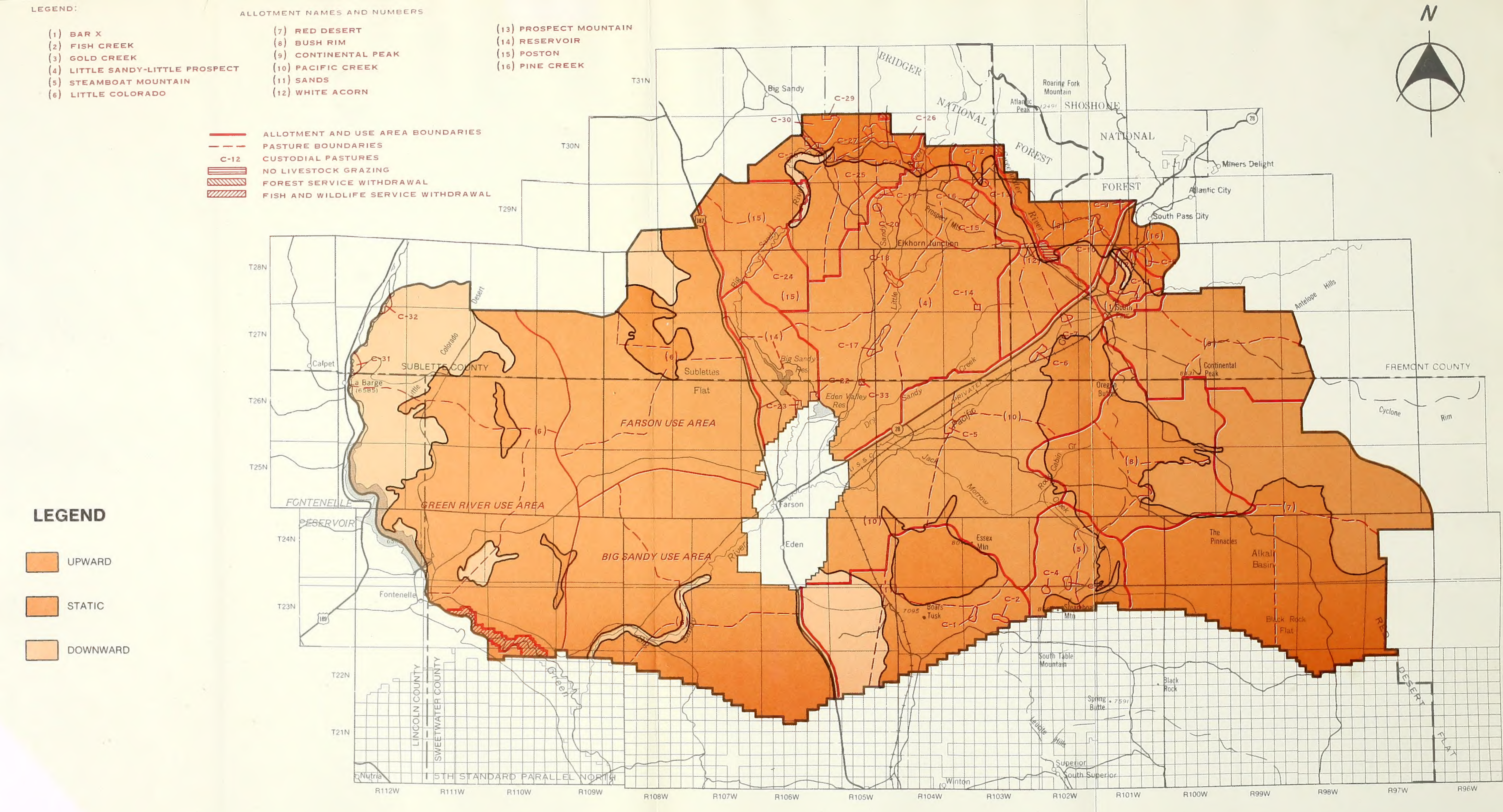
SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 2-13



RANGE CONDITION — MOOSE

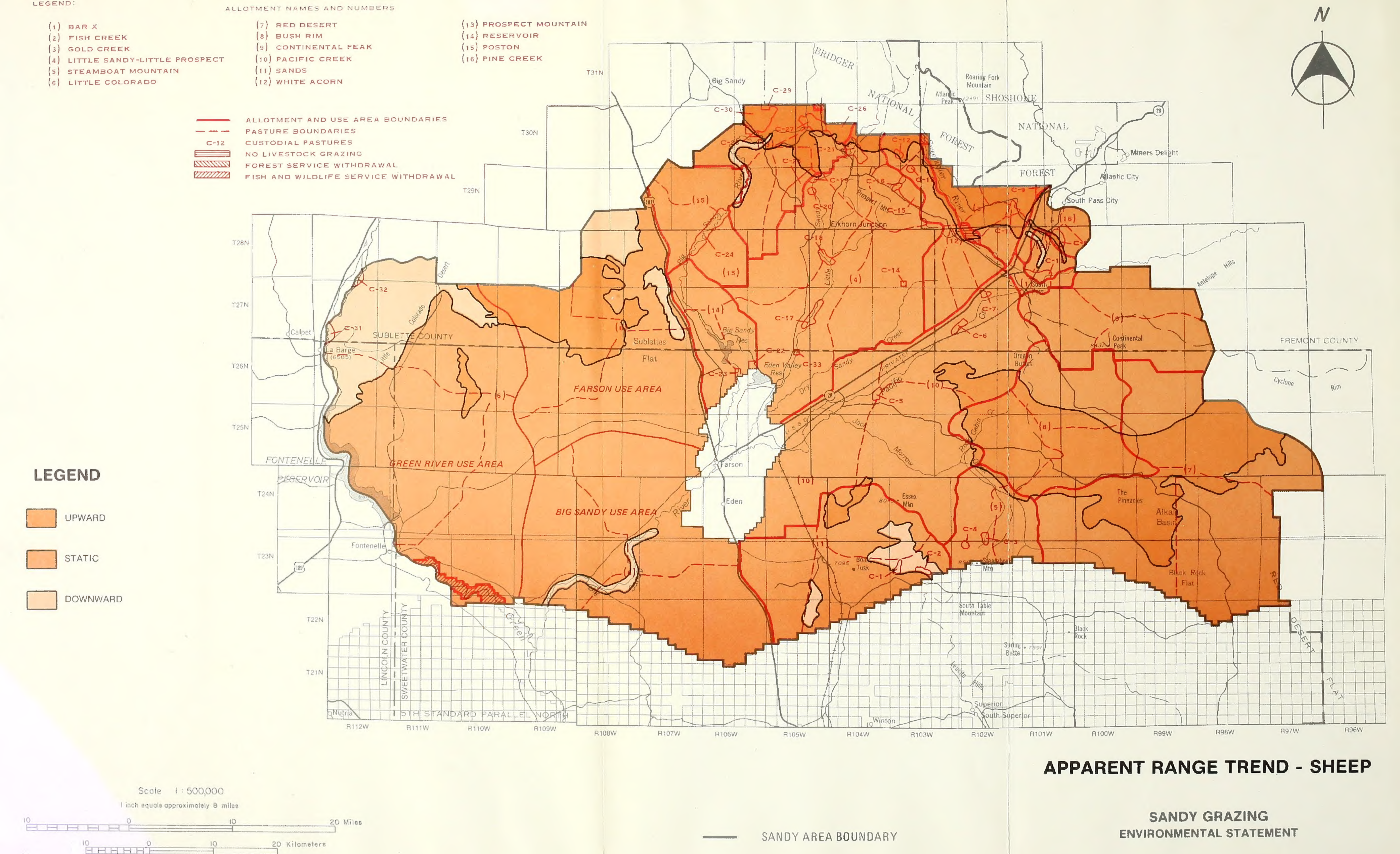
SANDY GRAZING
ENVIRONMENTAL STATEMENT



APPARENT RANGE TREND — CATTLE AND HORSES

SANDY GRAZING ENVIRONMENTAL STATEMENT

MAP 2-15



APPARENT RANGE TREND - SHEEP

SANDY GRAZING
ENVIRONMENTAL STATEMENT

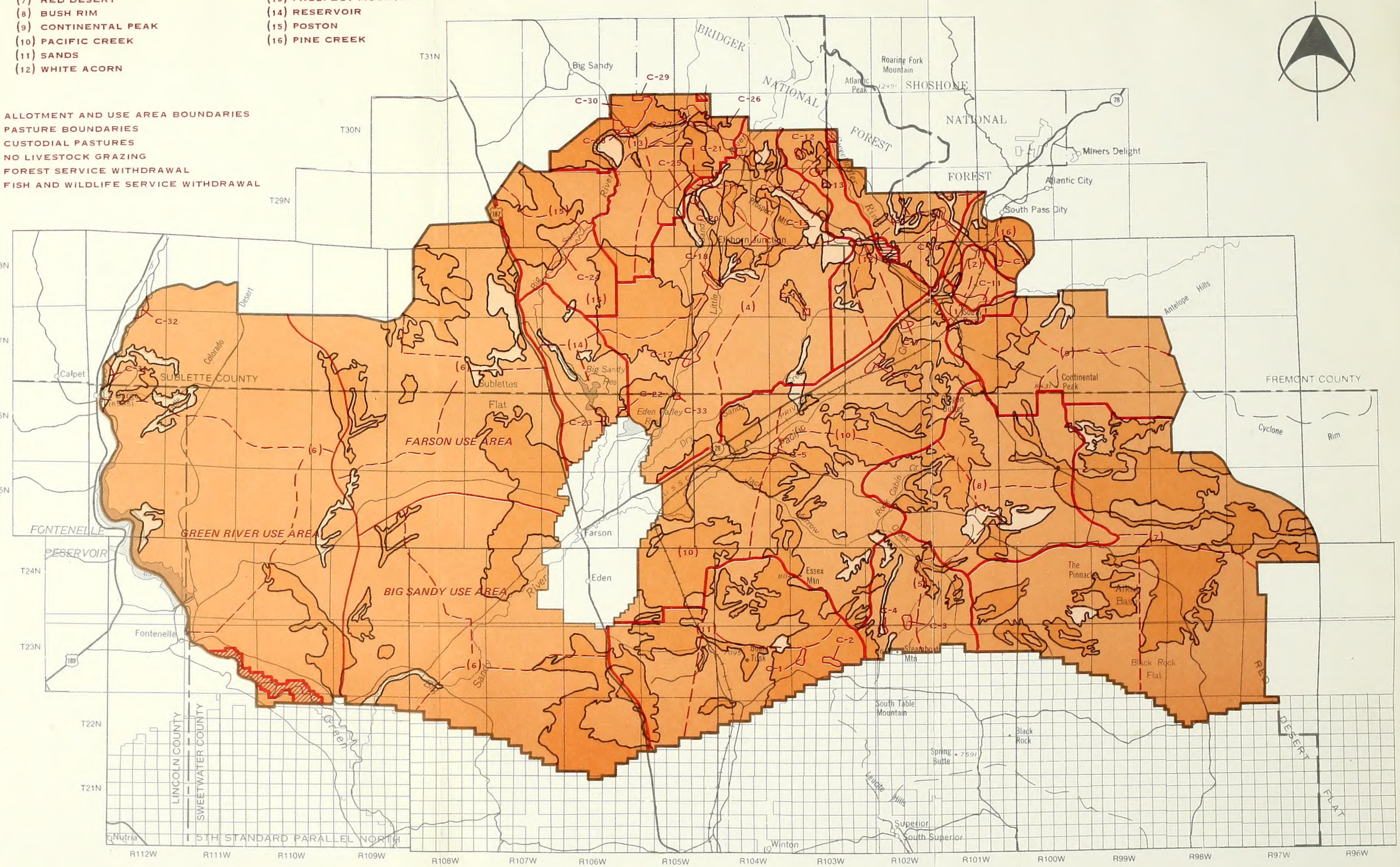
MAP 2-16

LEGEND:

ALLOTMENT NAMES AND NUMBERS

(1) BAR X
(2) FISH CREEK
(3) GOLD CREEK
(4) LITTLE SANDY-LITTLE PROSPECT
(5) STEAMBOAT MOUNTAIN
(6) LITTLE COLORADO
(7) RED DESERT
(8) BUSH RIM
(9) CONTINENTAL PEAK
(10) PACIFIC CREEK
(11) SANDS
(12) WHITE ACORN
(13) PROSPECT MOUNTAIN
(14) RESERVOIR
(15) POSTON
(16) PINE CREEK

ALLOTMENT AND USE AREA BOUNDARIES
PASTURE BOUNDARIES
C-12 CUSTODIAL PASTURES
NO LIVESTOCK GRAZING
FOREST SERVICE WITHDRAWAL
FISH AND WILDLIFE SERVICE WITHDRAWAL



LEGEND

UPWARD

STATIC

DOWNWARD

Scale 1 : 500,000

1 inch equals approximately 8 miles

10 0 10 20 Miles

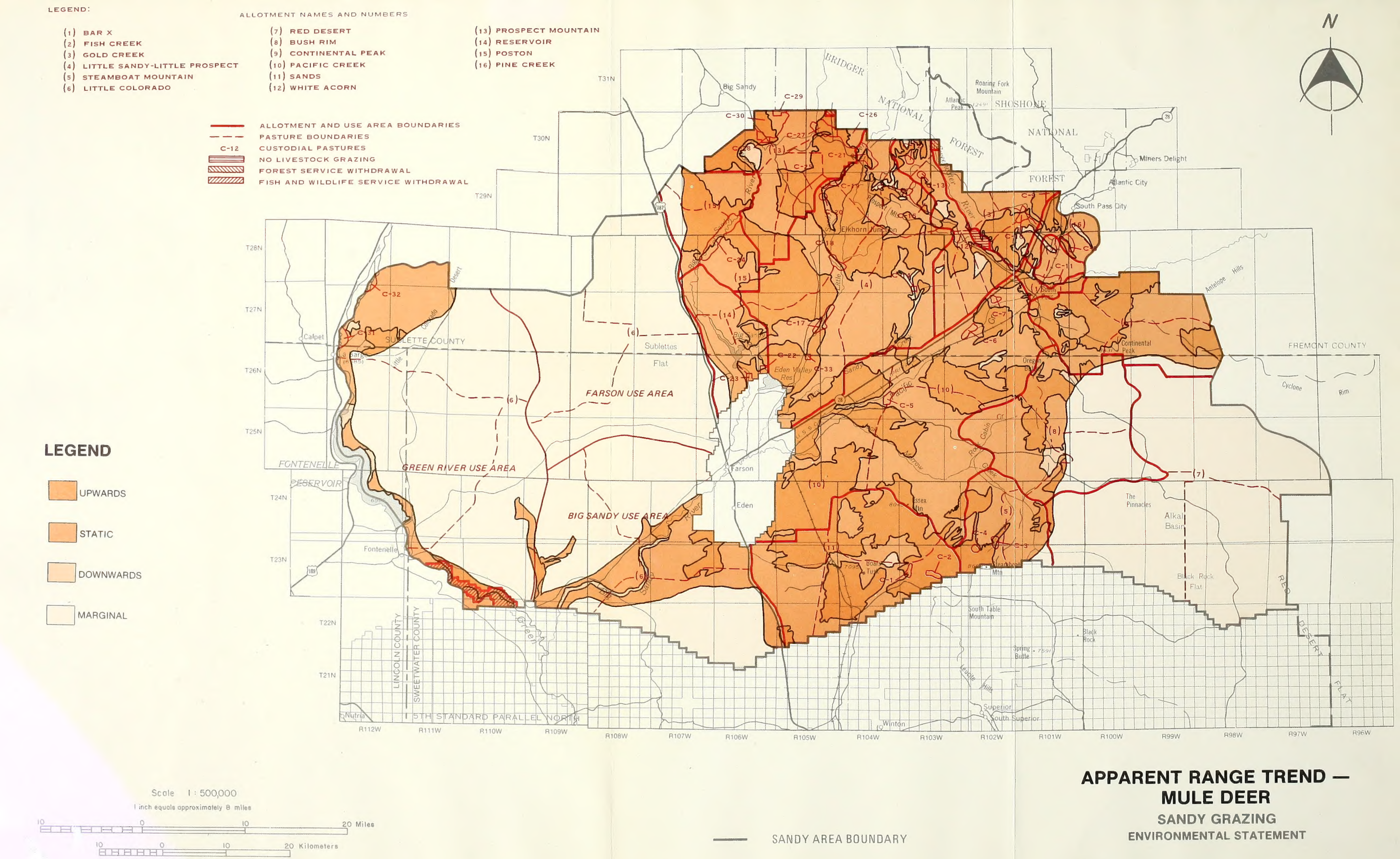
10 0 10 20 Kilometers

SANDY AREA BOUNDARY

APPARENT RANGE TREND — PRONGHORN ANTELOPE

SANDY GRAZING ENVIRONMENTAL STATEMENT

MAP 2-17



APPARENT RANGE TREND — MULE DEER

SANDY GRAZING ENVIRONMENTAL STATEMENT

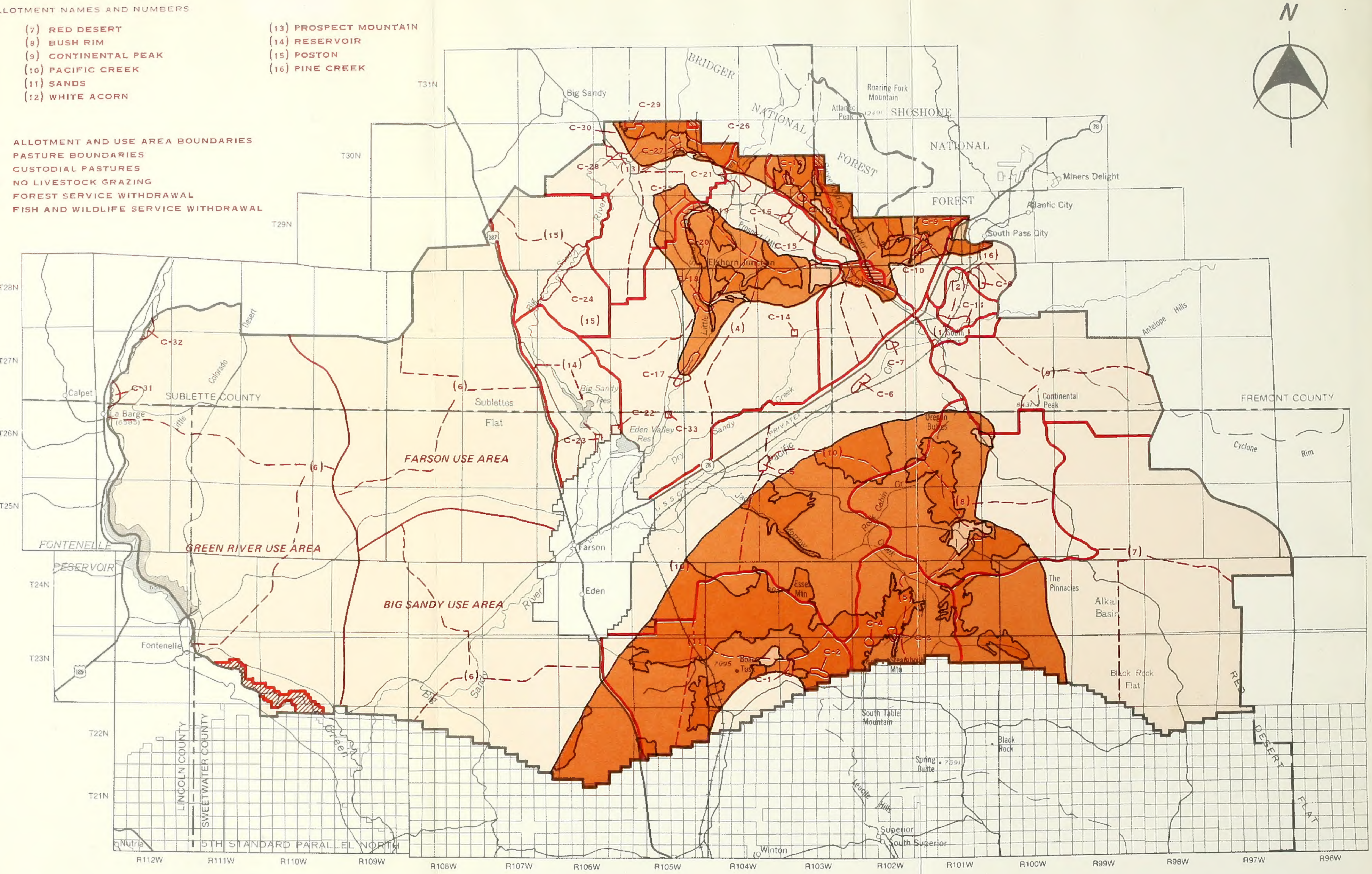
MAP 2-18

LEGEND:

ALLOTMENT NAMES AND NUMBERS

(1) BAR X
(2) FISH CREEK
(3) GOLD CREEK
(4) LITTLE SANDY-LITTLE PROSPECT
(5) STEAMBOAT MOUNTAIN
(6) LITTLE COLORADO
(7) RED DESERT
(8) BUSH RIM
(9) CONTINENTAL PEAK
(10) PACIFIC CREEK
(11) SANDS
(12) WHITE ACORN
(13) PROSPECT MOUNTAIN
(14) RESERVOIR
(15) POSTON
(16) PINE CREEK

ALLOTMENT AND USE AREA BOUNDARIES
PASTURE BOUNDARIES
C-12 CUSTODIAL PASTURES
NO LIVESTOCK GRAZING
FOREST SERVICE WITHDRAWAL
FISH AND WILDLIFE SERVICE WITHDRAWAL



LEGEND

UPWARD

STATIC

DOWNWARD

MARGINAL

Scale 1 : 500,000

1 inch equals approximately 8 miles

10 0 10 20 Miles

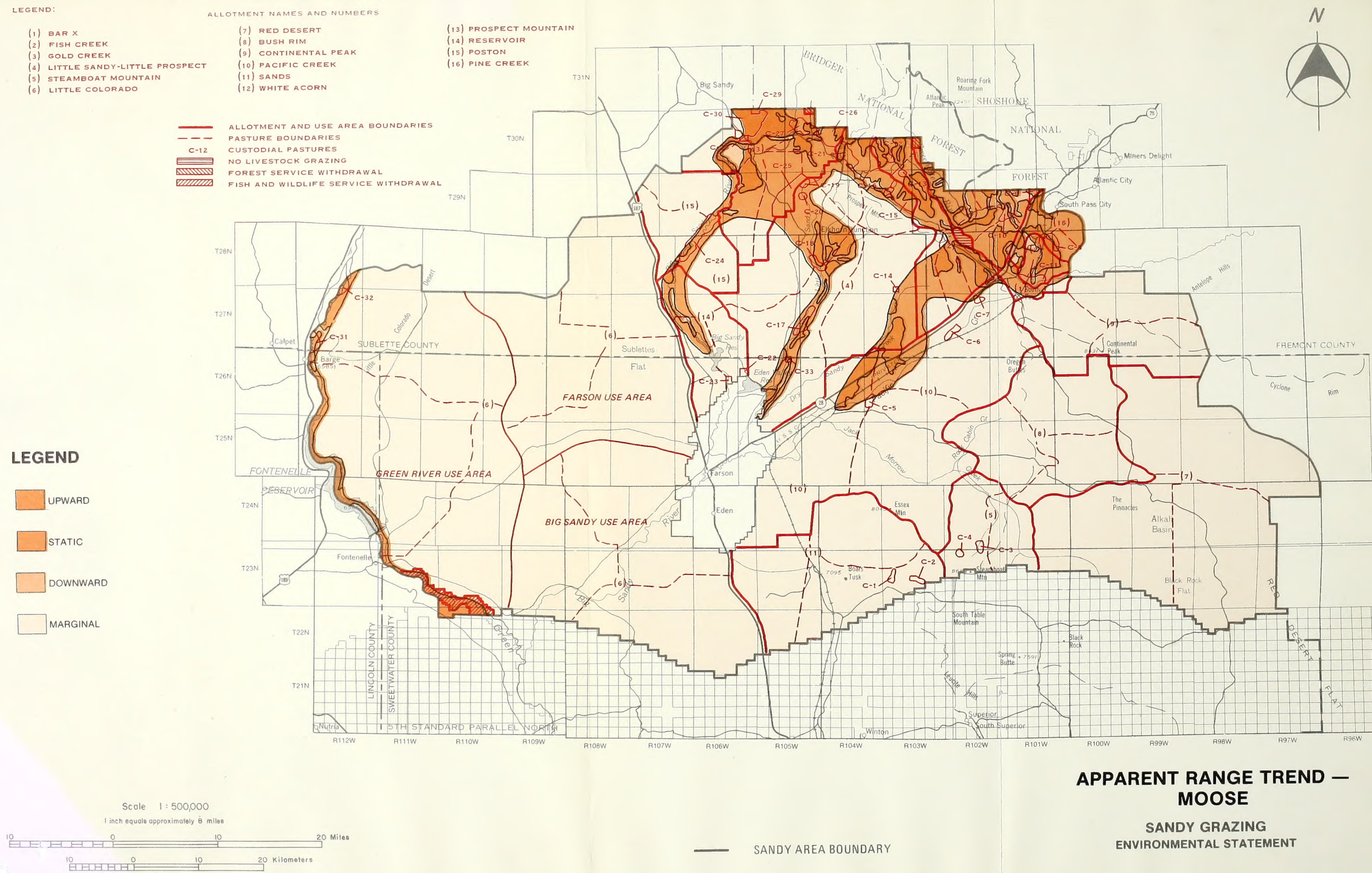
10 0 10 20 Kilometers

SANDY AREA BOUNDARY

APPARENT RANGE TREND — ELK

SANDY GRAZING ENVIRONMENTAL STATEMENT

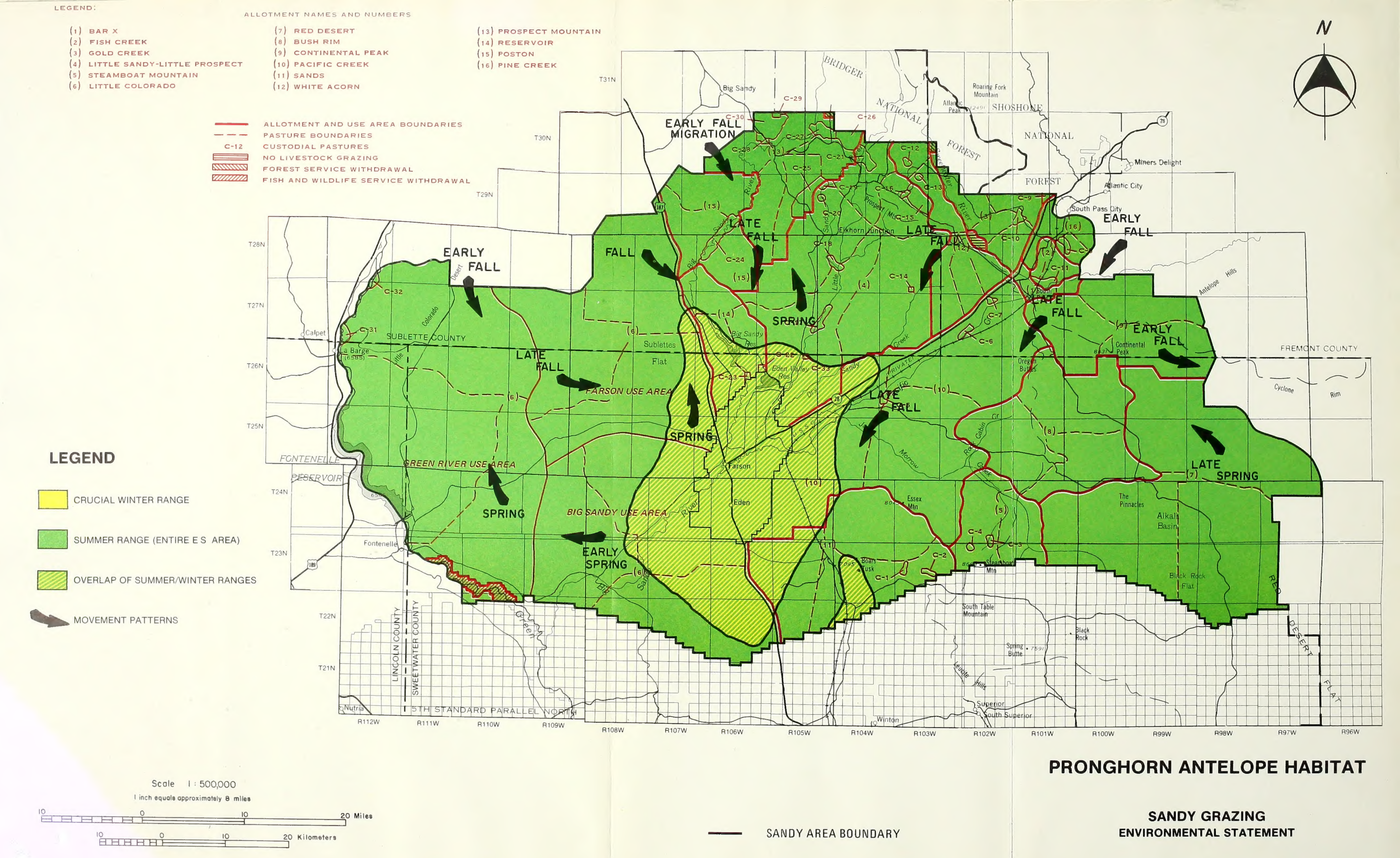
MAP 2-19



APPARENT RANGE TREND — MOOSE

SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 2 - 20



PRONGHORN ANTELOPE HABITAT

SANDY GRAZING
ENVIRONMENTAL STATEMENT

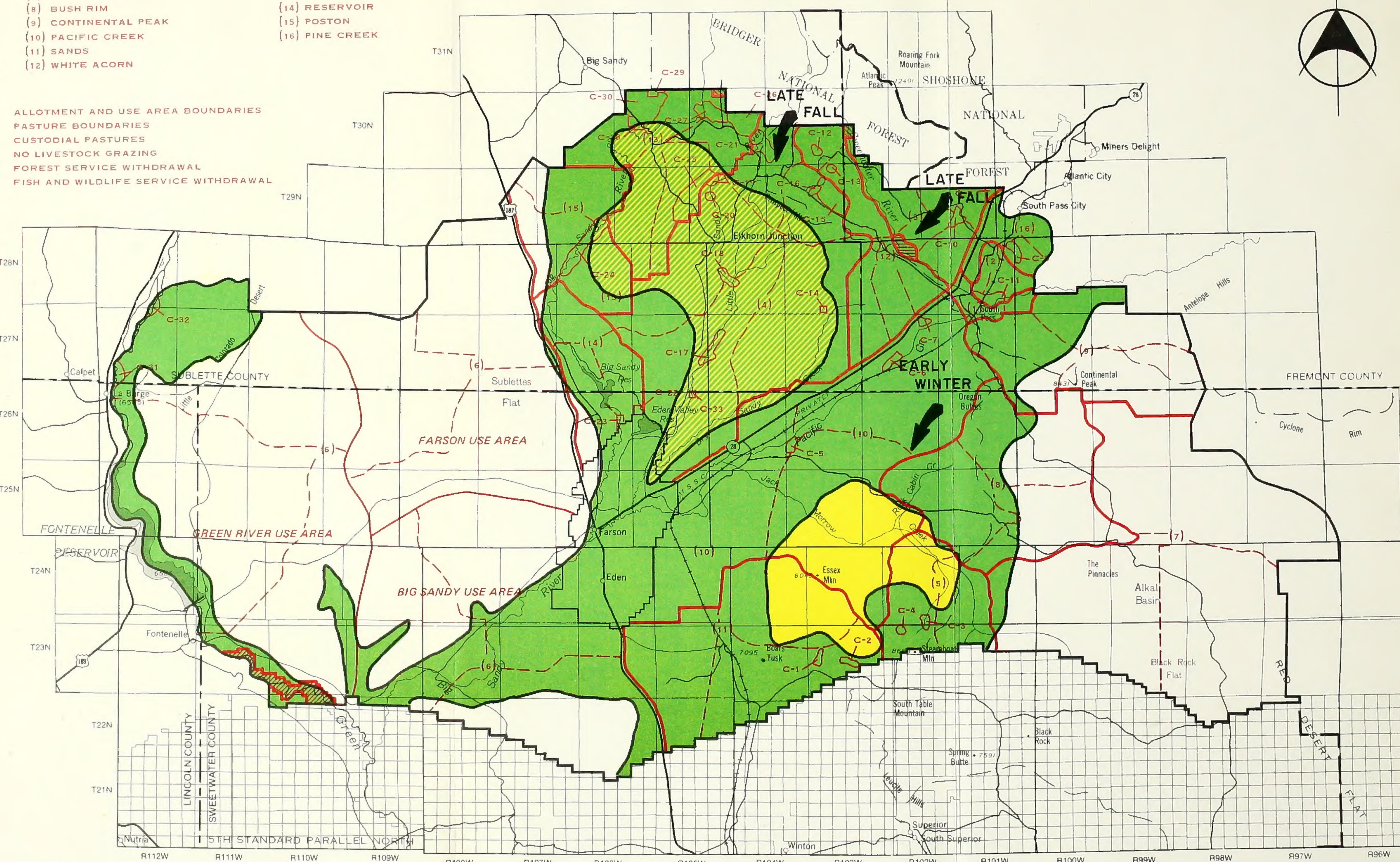
MAP 2 - 22

LEGEND:

ALLOTMENT NAMES AND NUMBERS

(1) BAR X
(2) FISH CREEK
(3) GOLD CREEK
(4) LITTLE SANDY-LITTLE PROSPECT
(5) STEAMBOAT MOUNTAIN
(6) LITTLE COLORADO
(7) RED DESERT
(8) BUSH RIM
(9) CONTINENTAL PEAK
(10) PACIFIC CREEK
(11) SANDS
(12) WHITE ACORN
(13) PROSPECT MOUNTAIN
(14) RESERVOIR
(15) POSTON
(16) PINE CREEK

ALLOTMENT AND USE AREA BOUNDARIES
PASTURE BOUNDARIES
C-12 CUSTODIAL PASTURES
NO LIVESTOCK GRAZING
FOREST SERVICE WITHDRAWAL
FISH AND WILDLIFE SERVICE WITHDRAWAL



LEGEND

CRUCIAL WINTER RANGE

YEAR LONG RANGE

OVERLAP OF YEAR LONG/WINTER RANGES

MOVEMENT PATTERNS

Scale 1 : 500,000

1 inch equals approximately 8 miles

10 0 10 20 Miles

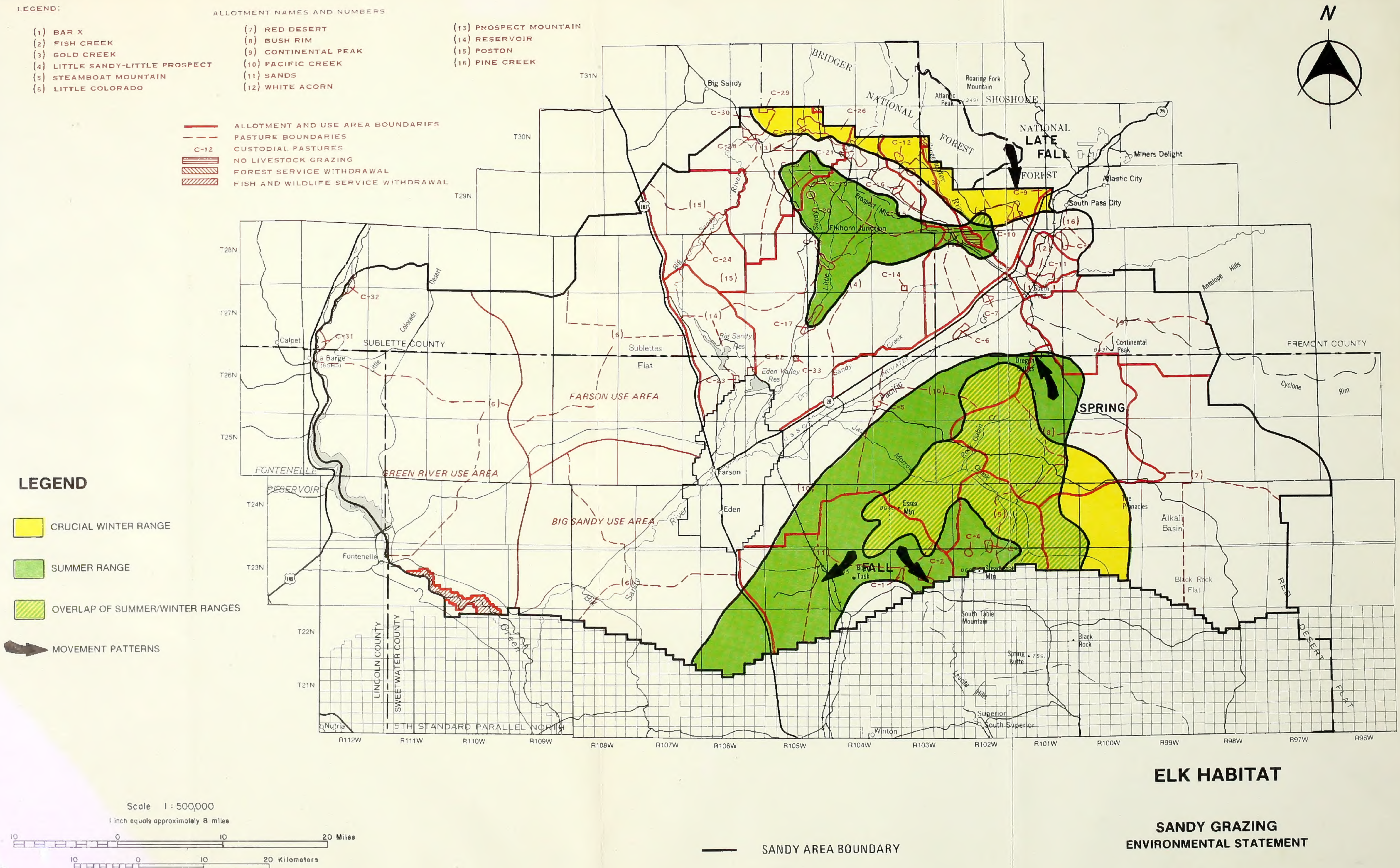
10 0 10 20 Kilometers

SANDY AREA BOUNDARY

MULE DEER HABITAT

SANDY GRAZING ENVIRONMENTAL STATEMENT

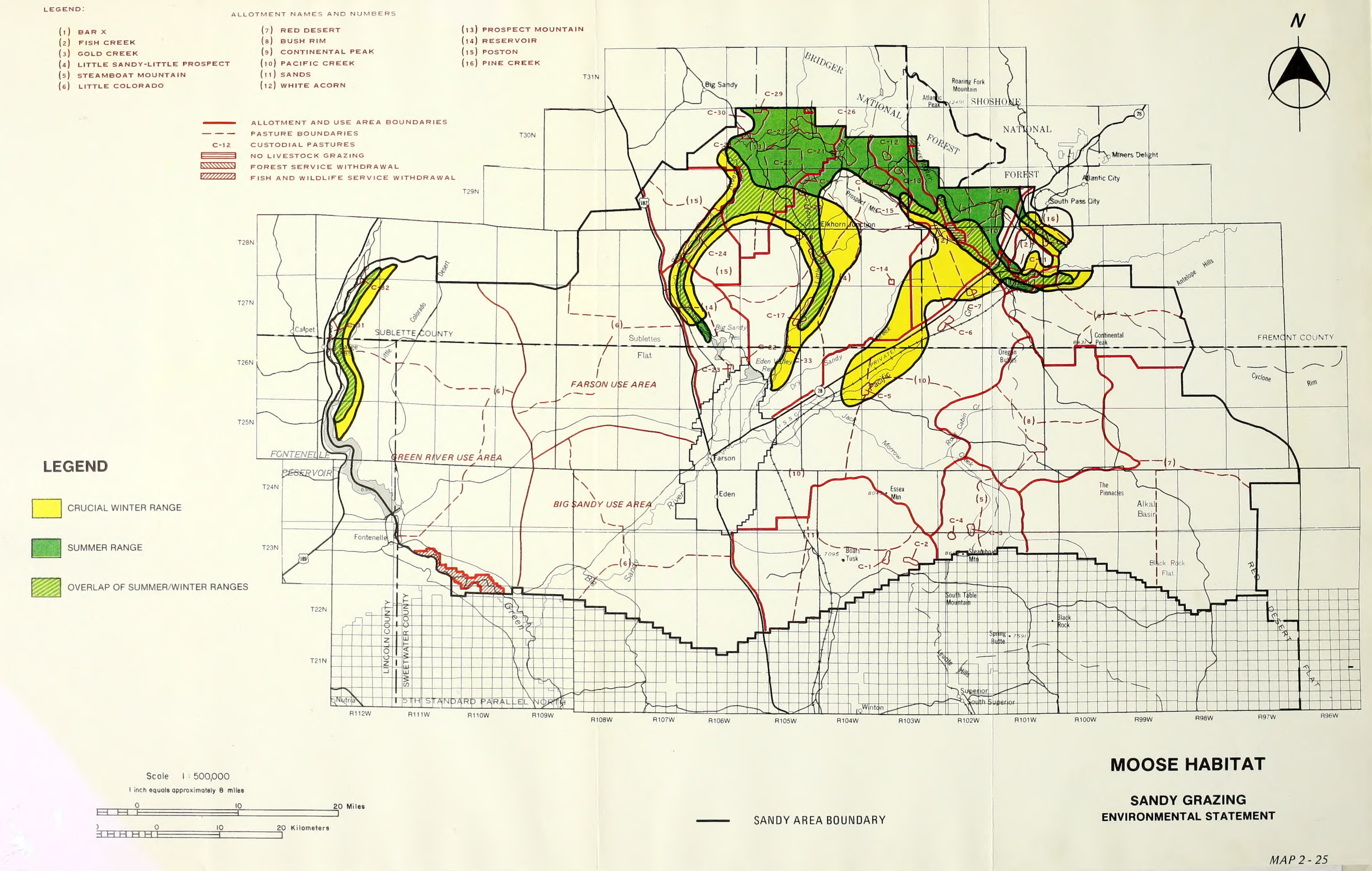
MAP 2 - 23



ELK HABITAT

SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 2 - 24



LEGEND:
ALLOTMENT NAMES AND NUMBERS
(1) BAR X
(2) FISH CREEK
(3) GOLD CREEK
(4) LITTLE SANDY-LITTLE PROSPECT
(5) STEAMBOAT MOUNTAIN
(6) LITTLE COLORADO
(7) RED DESERT
(8) BUSH RIM
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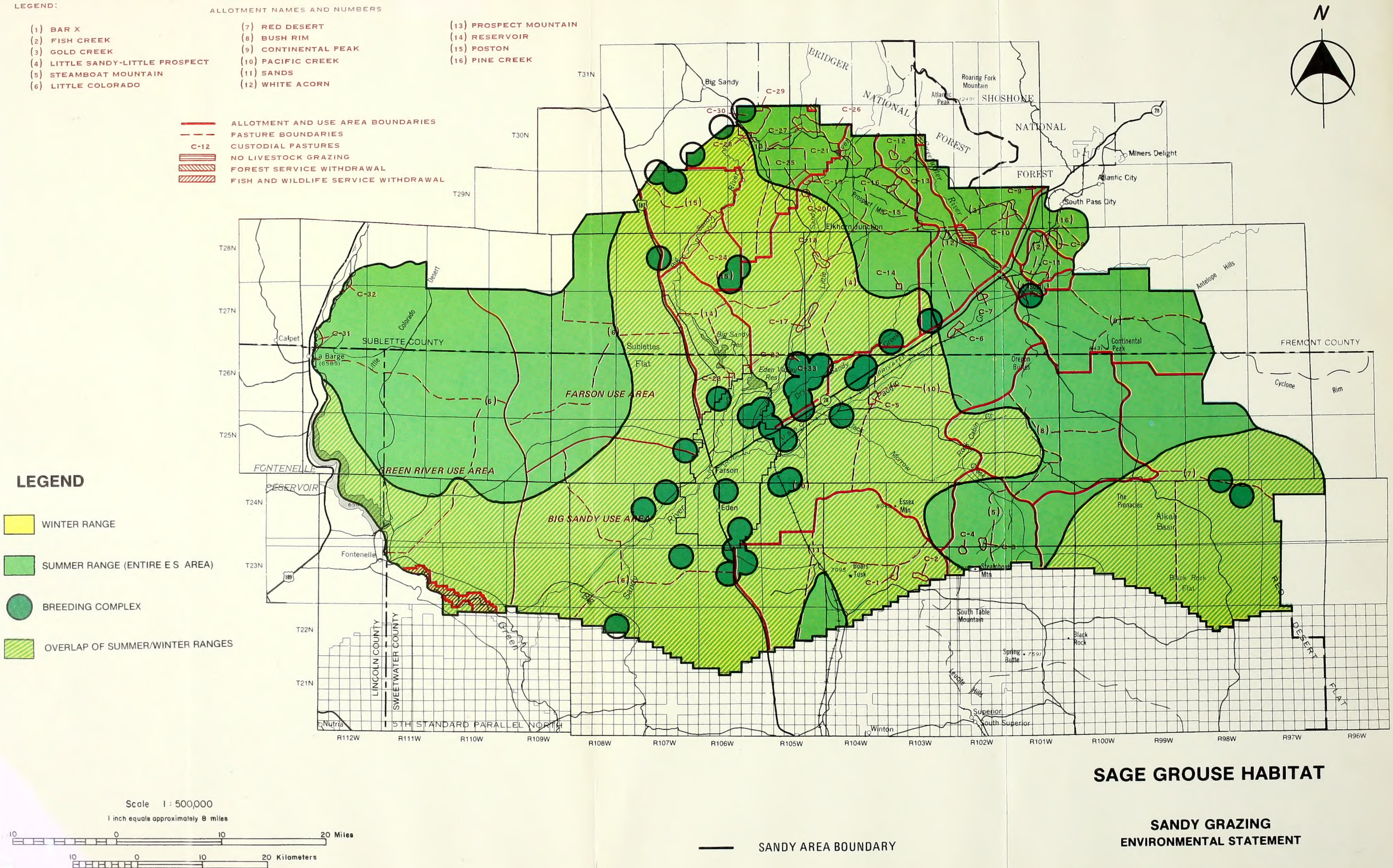
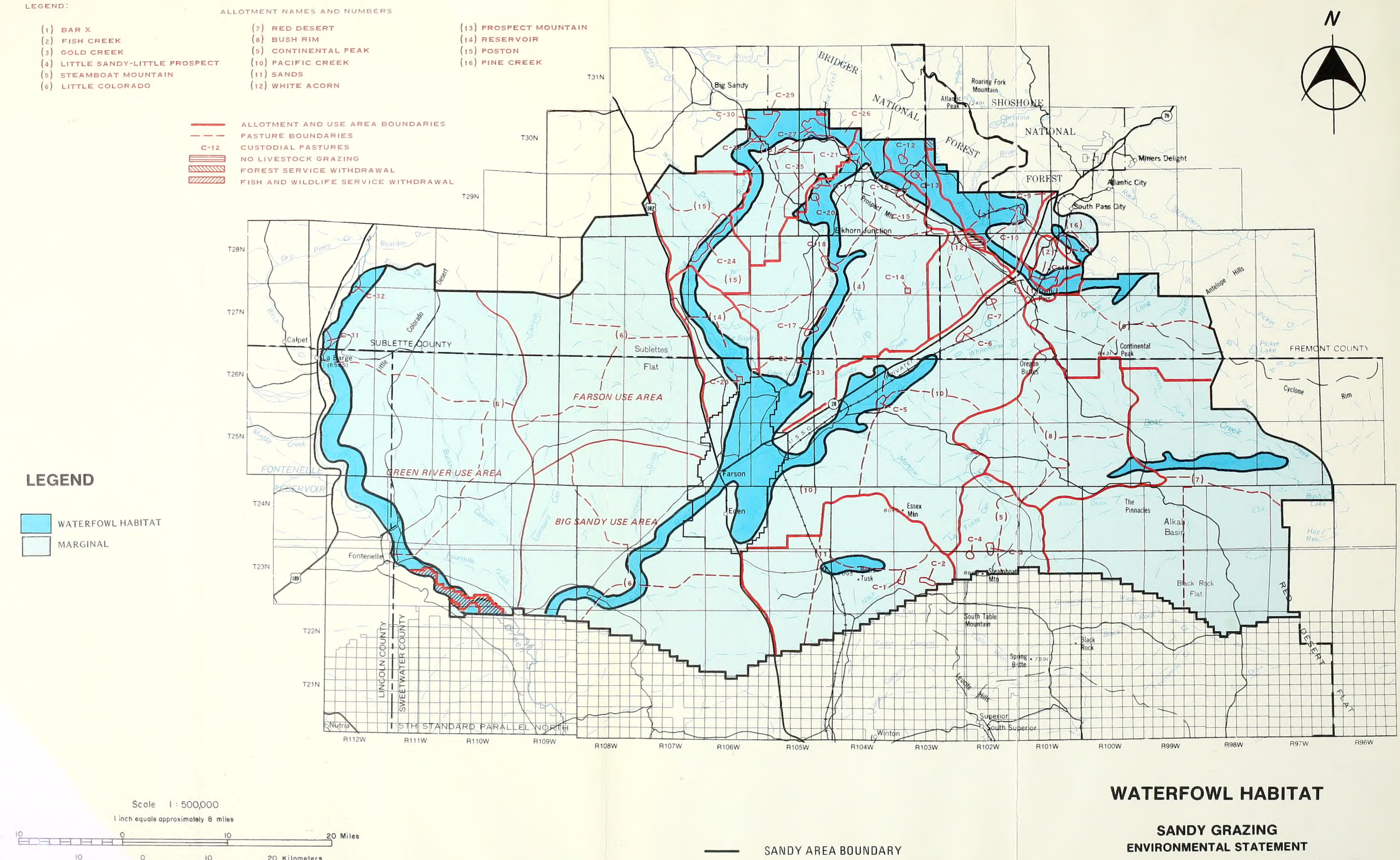
(15) POSTON
(16) PINE CREEK
ALLOTMENT AND USE AREA BOUNDARIES
PASTURE BOUNDARIES
C-12 CUSTODIAL PASTURES
NO LIVESTOCK GRAZING
FOREST SERVICE WITHDRAWAL
FISH AND WILDLIFE SERVICE WITHDRAWAL
LEGEND
CRUCIAL WINTER RANGE
SUMMER RANGE
OVERLAP OF SUMMER/WINTER RANGES
BRIDGER NATIONAL FOREST
SHOSHONE NATIONAL FOREST
SUBLETTE COUNTY
FREMONT COUNTY
LINCOLN COUNTY
SWEETWATER COUNTY
FARSON USE AREA
GREEN RIVER USE AREA
BIG SANDY USE AREA
FONTENELLE RESERVOIR
5TH STANDARD PARALLEL NORTH
Big Sandy
Farson
Eden
Fontenelle
Atlantic City
South Pass City
Miners Delight
Elkhorn Junction
Sublettes Flat
Scale 1 : 500,000
1 inch equals approximately 8 miles
20 Miles
20 Kilometers
SANDY AREA BOUNDARY
MOOSE HABITAT
SANDY GRAZING
ENVIRONMENTAL STATEMENT
MAP 2-25



SAGE GROUSE HABITAT

SANDY GRAZING
ENVIRONMENTAL STATEMENT

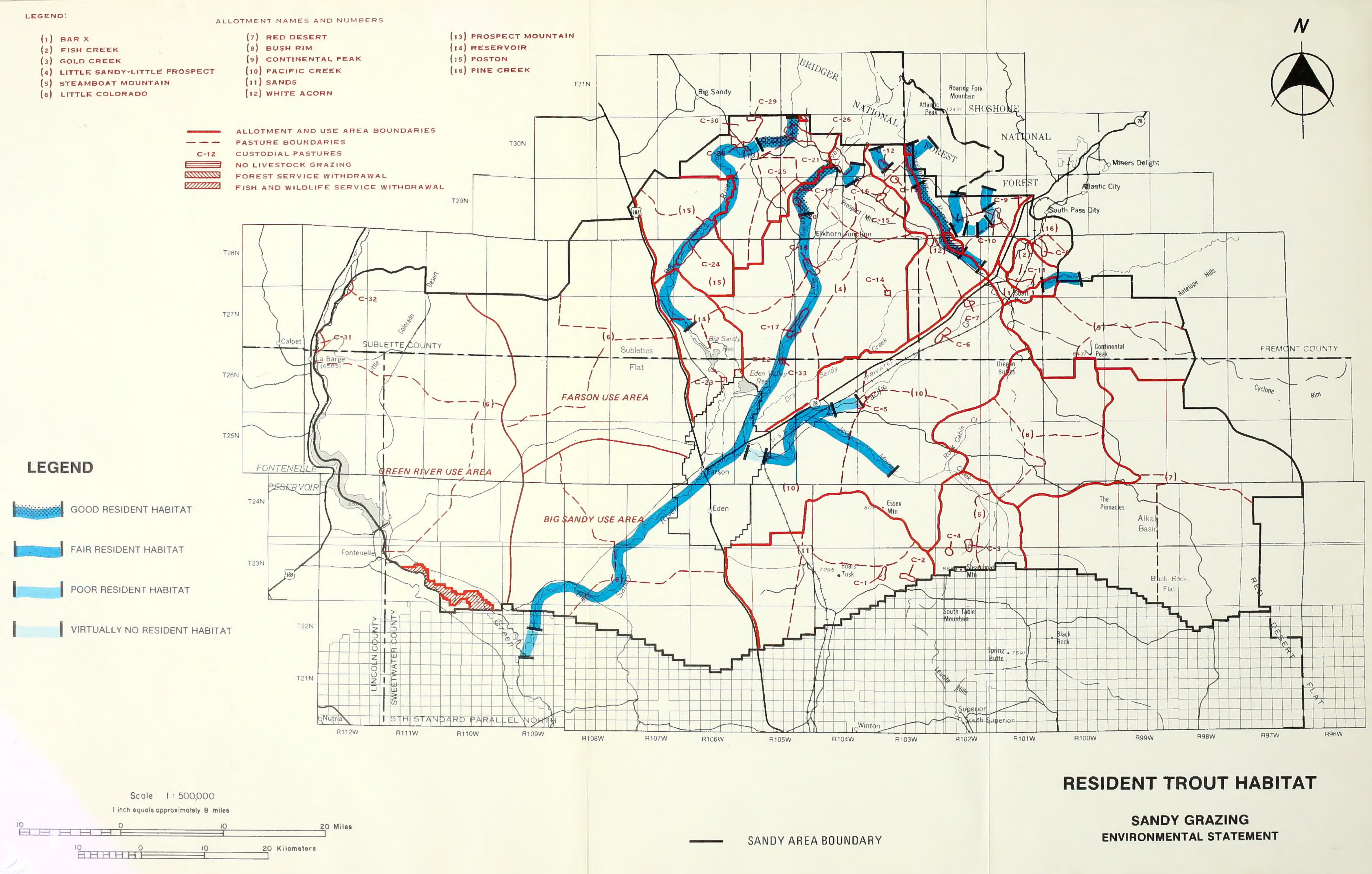
MAP 2-26



WATERFOWL HABITAT

SANDY GRAZING ENVIRONMENTAL STATEMENT

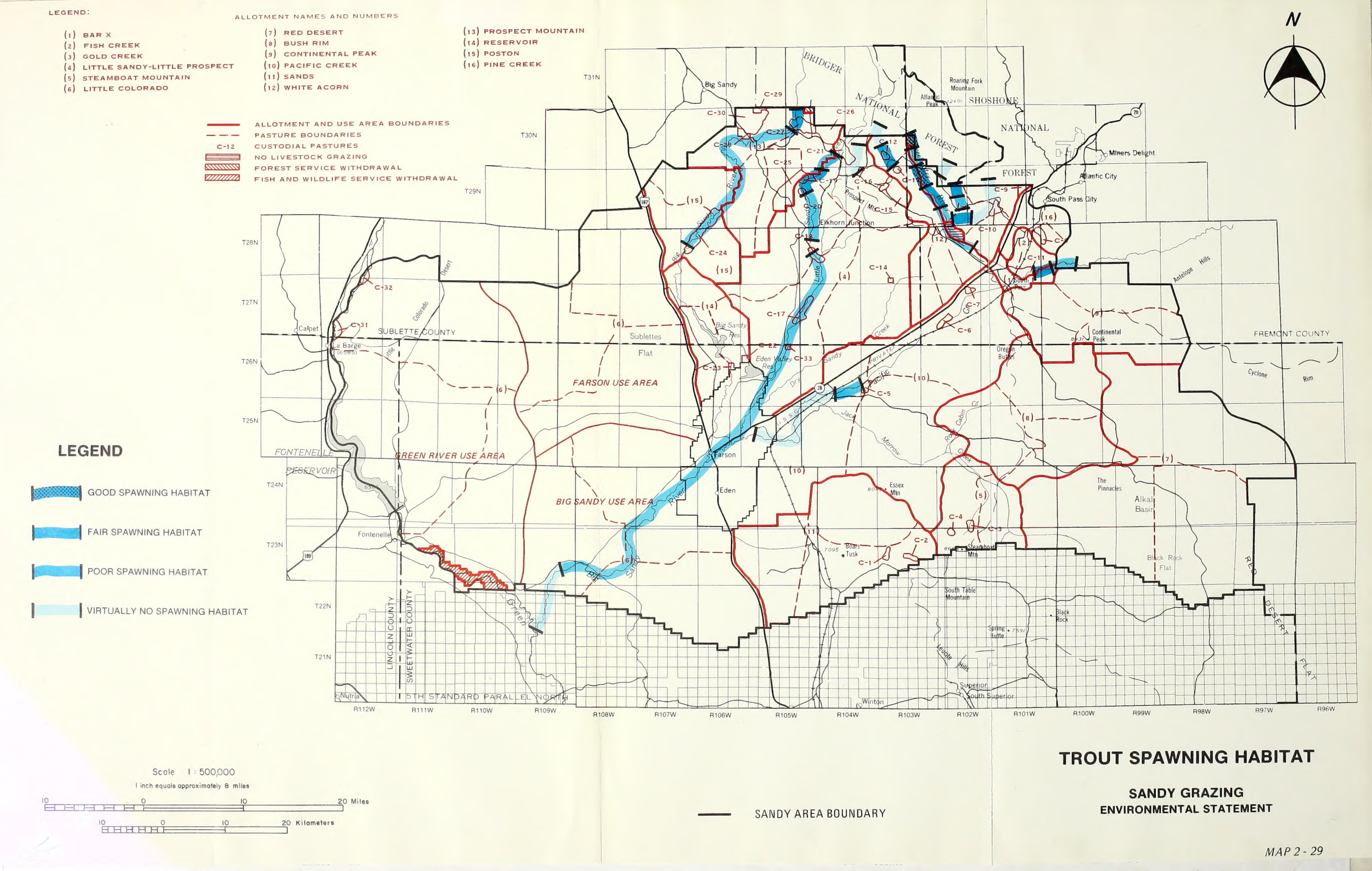
MAP 2 - 27



RESIDENT TROUT HABITAT

SANDY GRAZING ENVIRONMENTAL STATEMENT

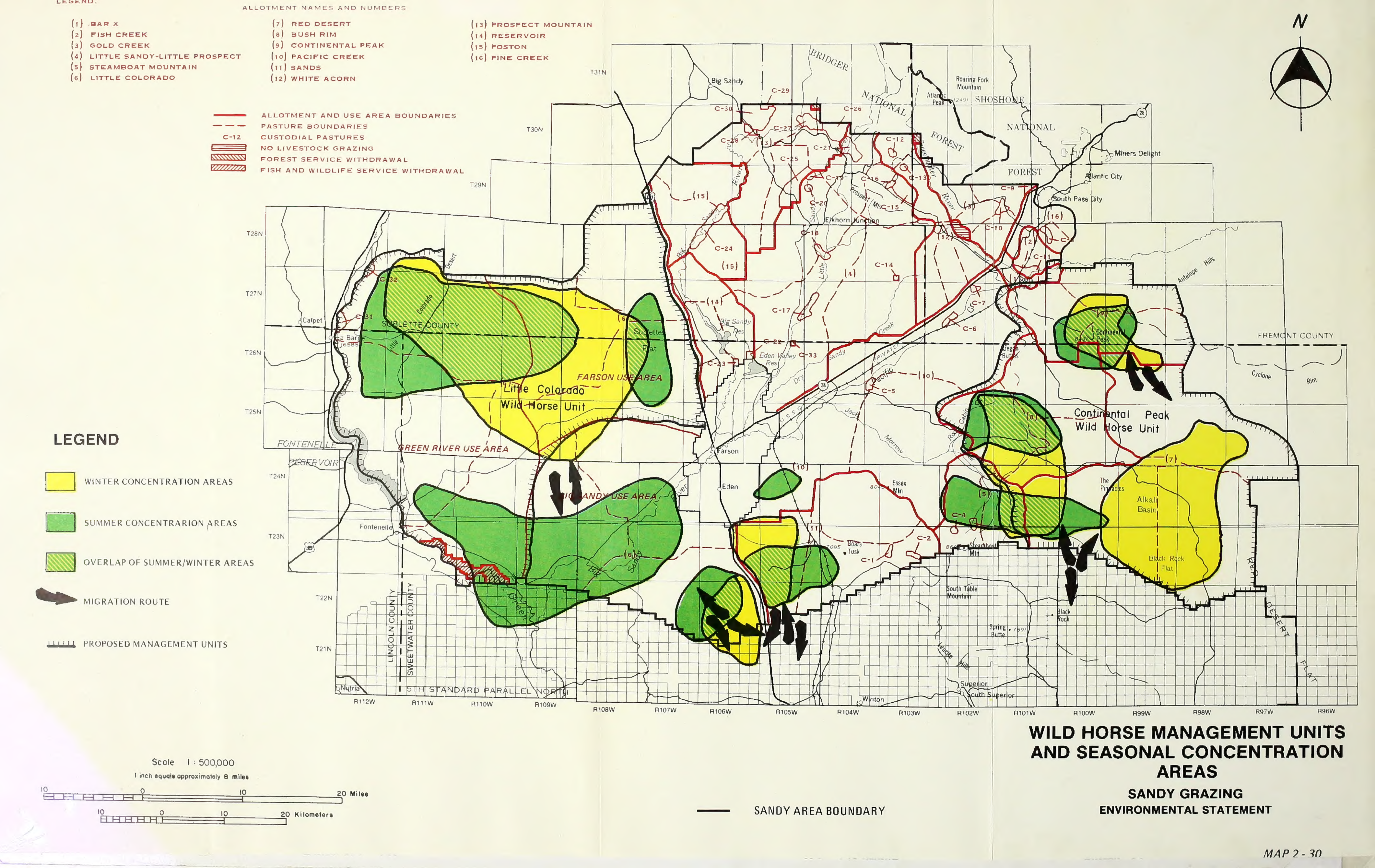
MAP 2 - 28



TROUT SPAWNING HABITAT

SANDY GRAZING ENVIRONMENTAL STATEMENT

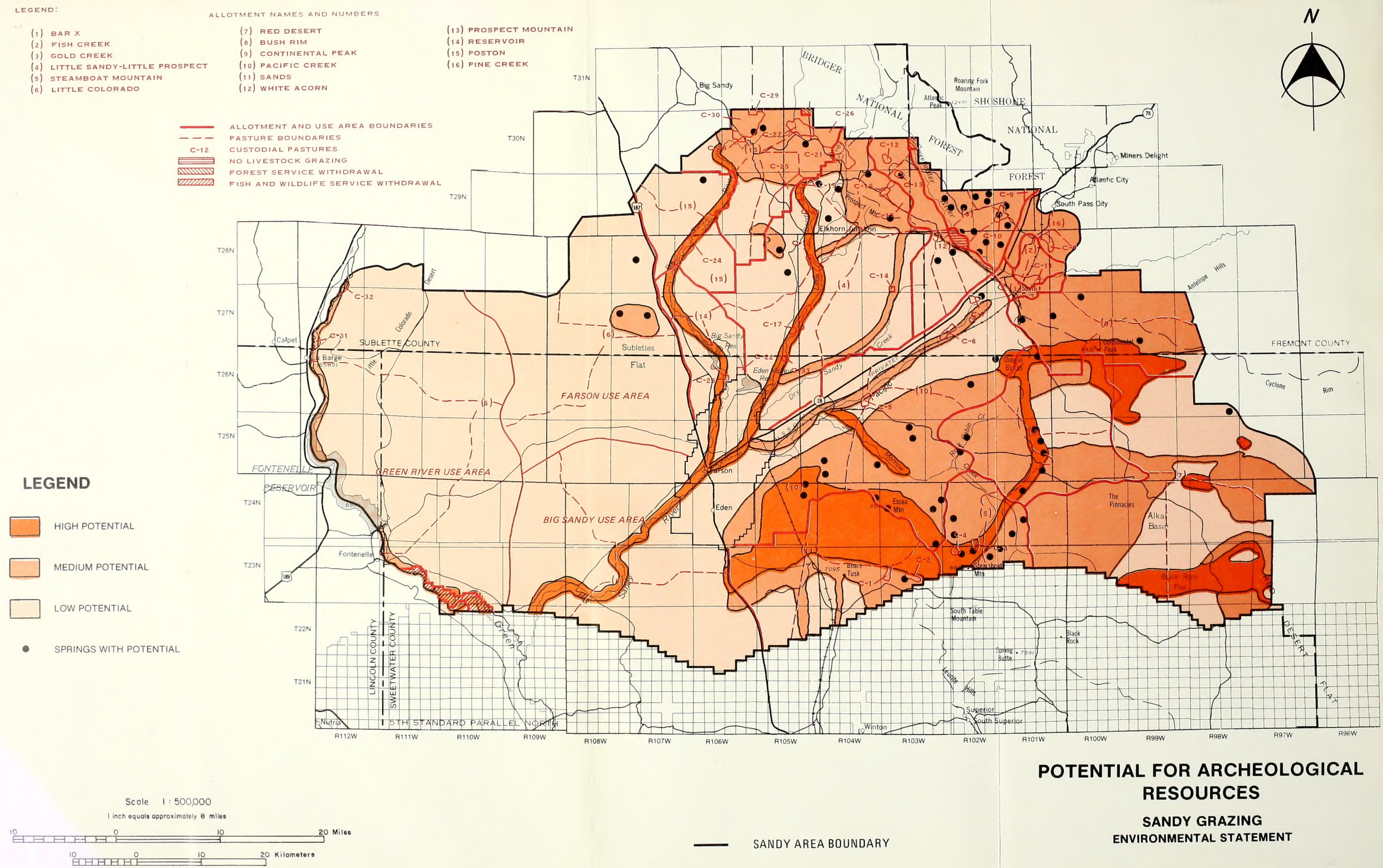
MAP 2-29



WILD HORSE MANAGEMENT UNITS AND SEASONAL CONCENTRATION AREAS

SANDY GRAZING ENVIRONMENTAL STATEMENT

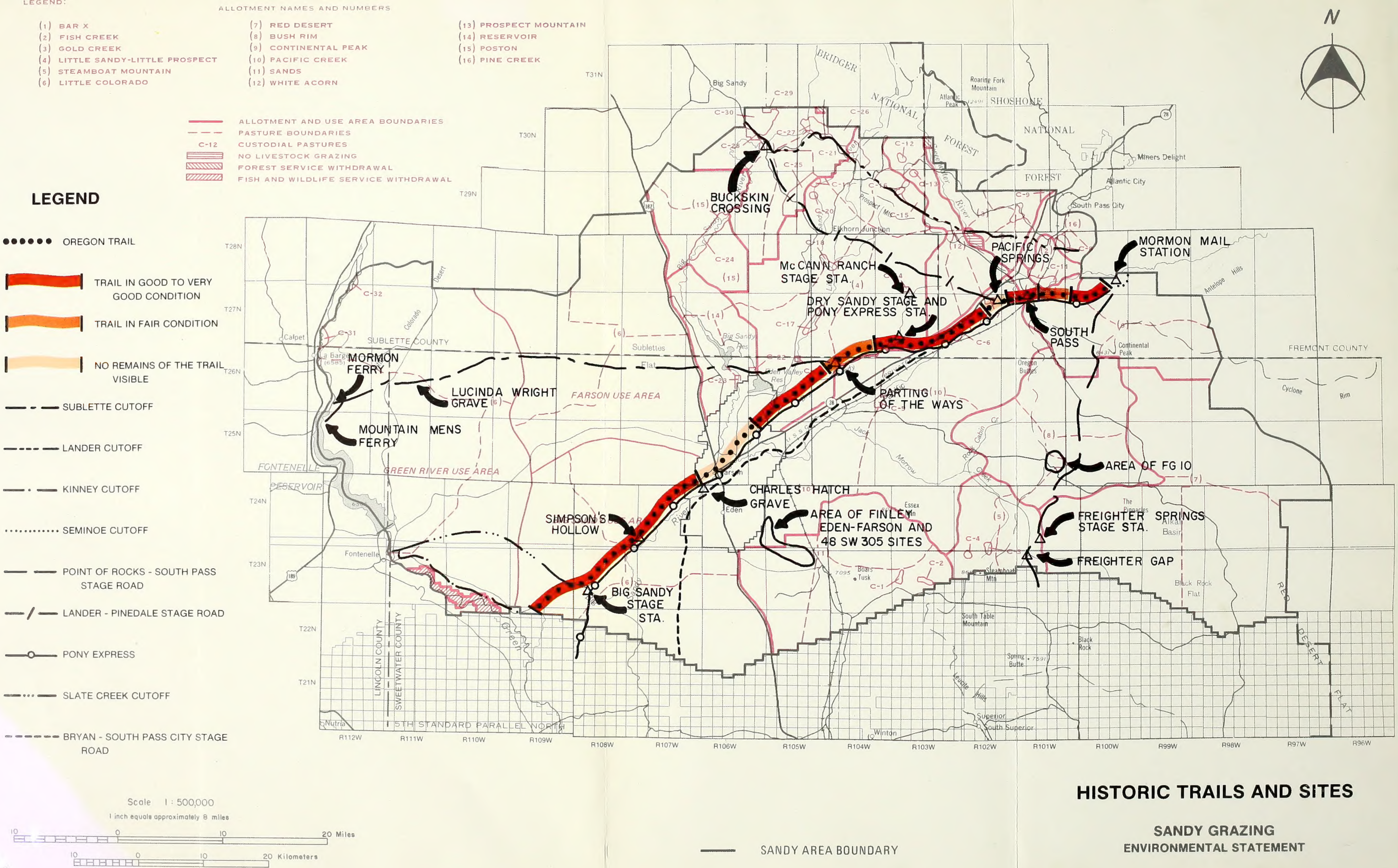
MAP 2 - 30



POTENTIAL FOR ARCHEOLOGICAL RESOURCES

SANDY GRAZING
ENVIRONMENTAL STATEMENT

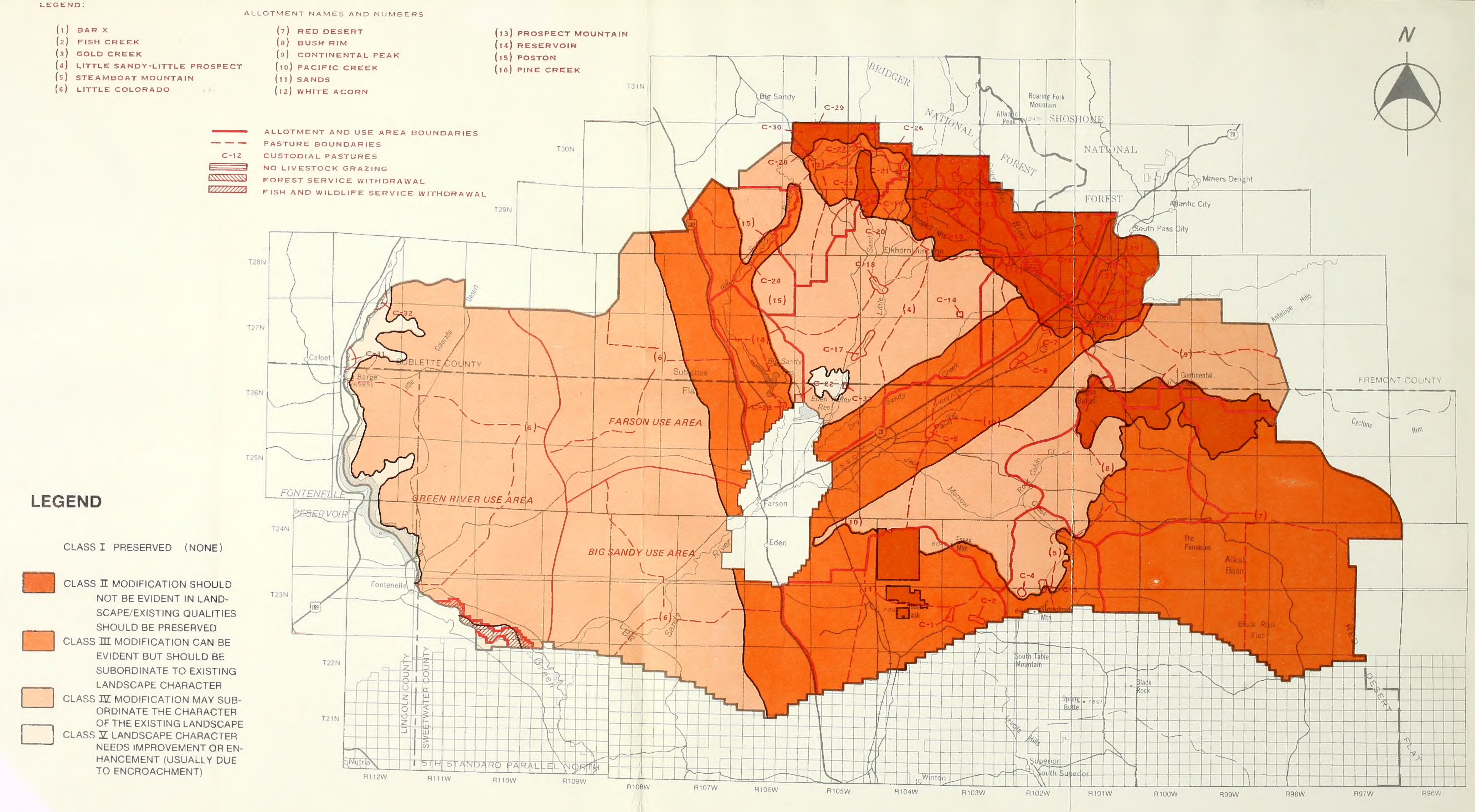
MAP 2 - 31



HISTORIC TRAILS AND SITES

SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 2-32



Scale 1 : 500,000

1 inch equals approximately 8 miles

10 0 10 20 Miles

10 0 10 20 Kilometers

SANDY AREA BOUNDARY

VISUAL RESOURCE MANAGEMENT CLASSES

SANDY GRAZING
ENVIRONMENTAL STATEMENT

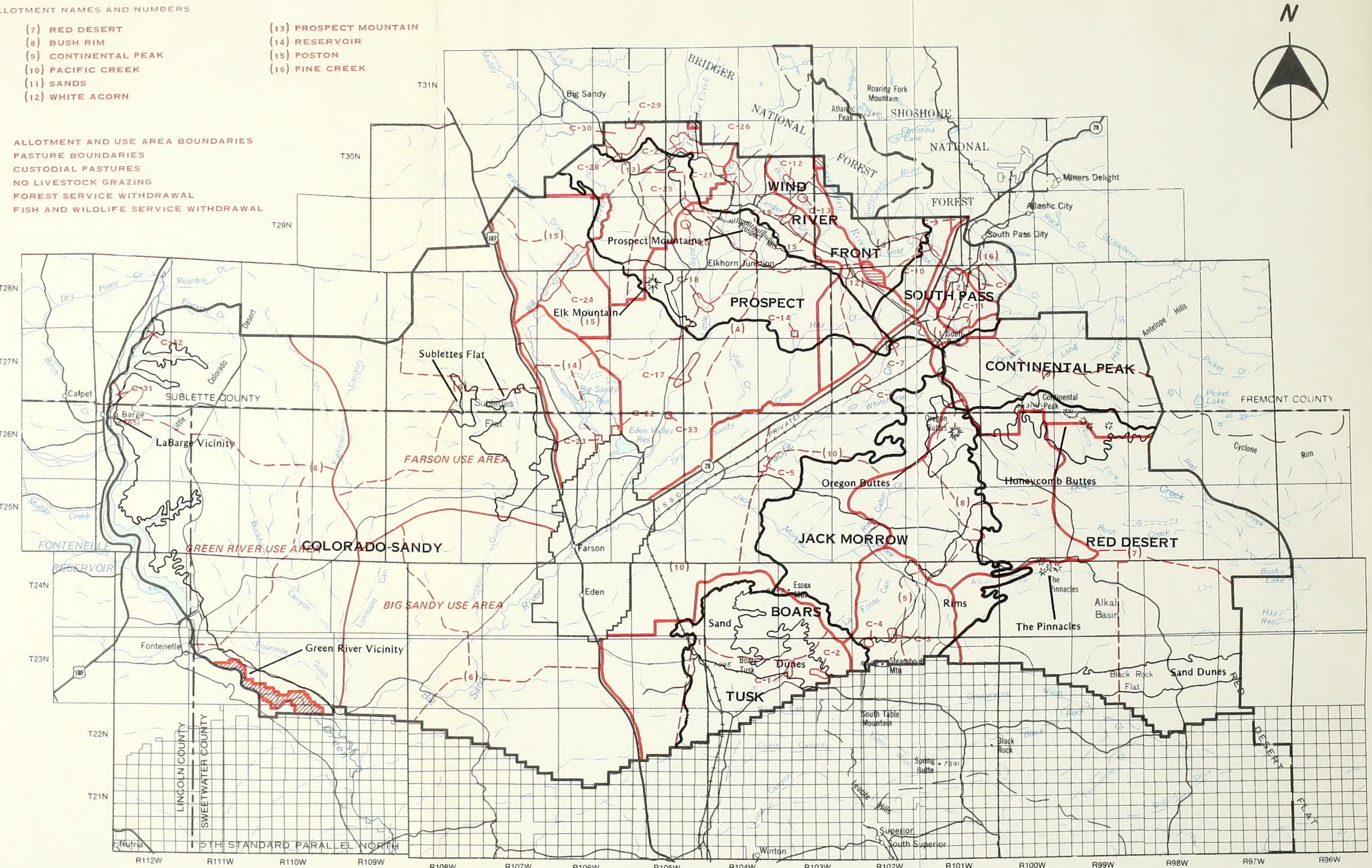
MAP 2-33

LEGEND:

ALLOTMENT NAMES AND NUMBERS

(1) BAR X
(2) FISH CREEK
(3) GOLD CREEK
(4) LITTLE SANDY-LITTLE PROSPECT
(5) STEAMBOAT MOUNTAIN
(6) LITTLE COLORADO
(7) RED DESERT
(8) BUSH RIM
(9) CONTINENTAL PEAK
(10) PACIFIC CREEK
(11) SANDS
(12) WHITE ACORN
(13) PROSPECT MOUNTAIN
(14) RESERVOIR
(15) POSTON
(16) PINE CREEK

ALLOTMENT AND USE AREA BOUNDARIES
PASTURE BOUNDARIES
C-12 CUSTODIAL PASTURES
NO LIVESTOCK GRAZING
FOREST SERVICE WITHDRAWAL
FISH AND WILDLIFE SERVICE WITHDRAWAL



LEGEND

LANDSCAPE TYPES

LANDSCAPE SUBTYPES OR FEATURES

SANDY AREA BOUNDARY

Scale 1 : 500,000
1 inch equals approximately 8 miles

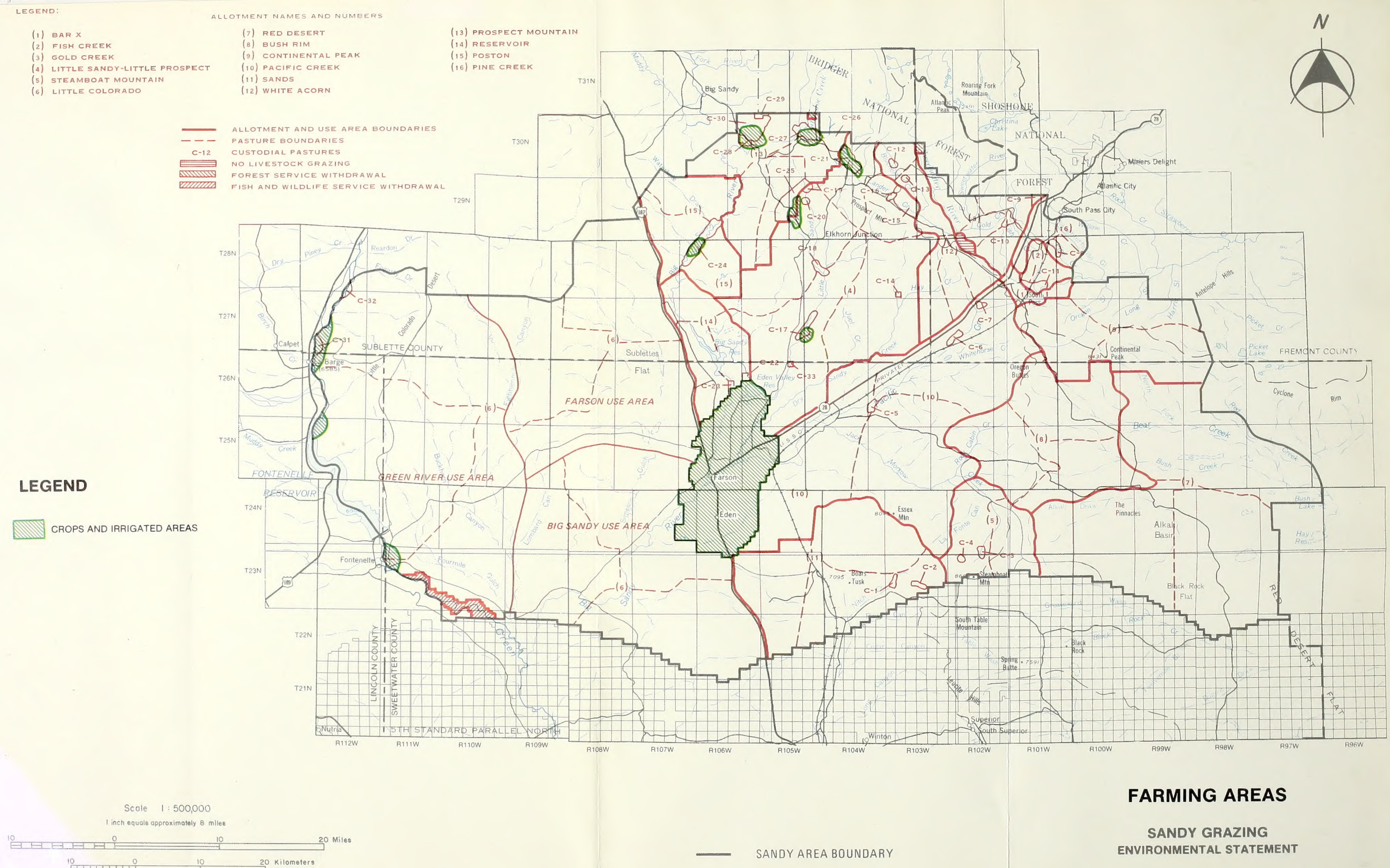
10 0 10 20 Miles

10 0 10 20 Kilometers

LANDSCAPE TYPES

SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 2-34



FARMING AREAS

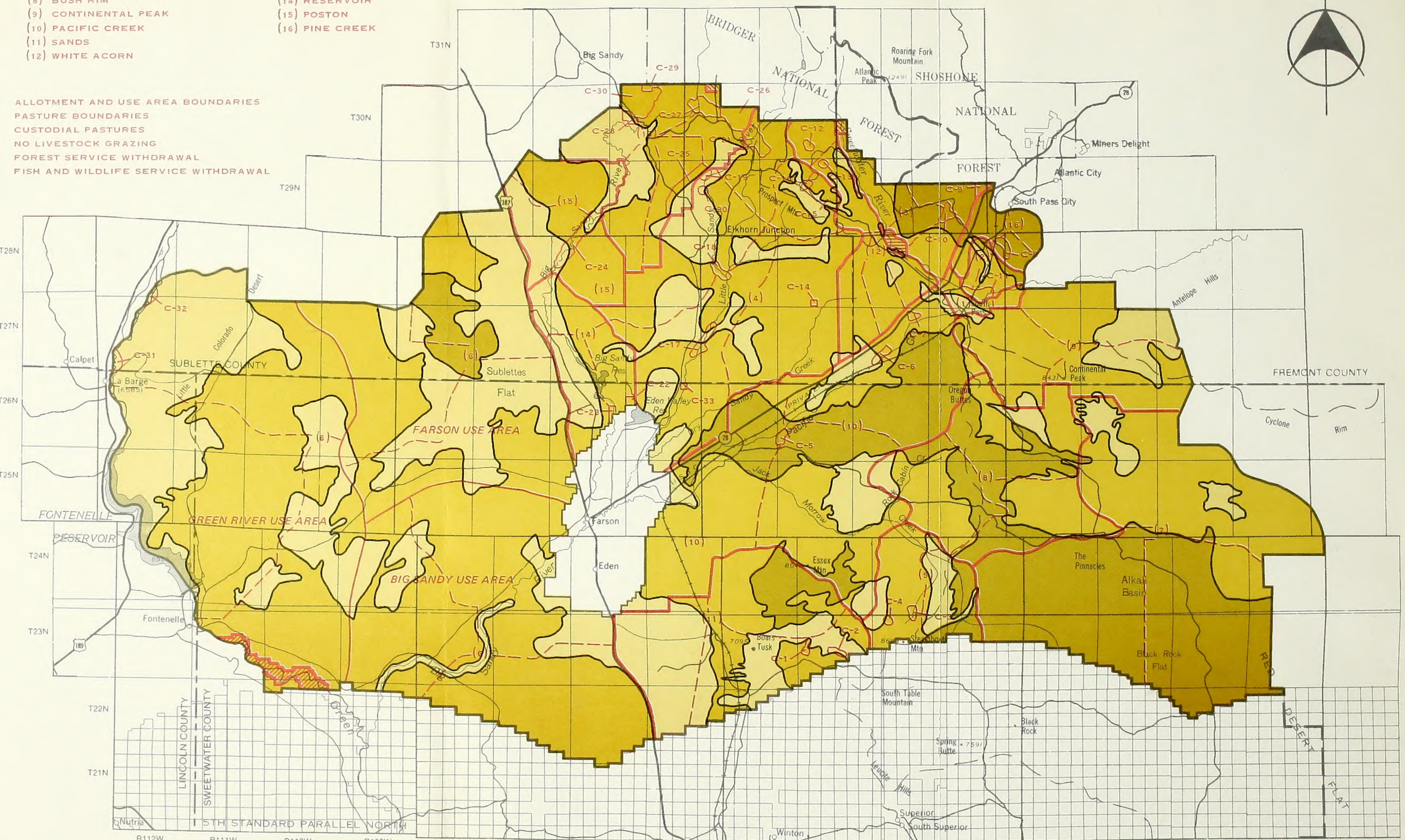
SANDY GRAZING
ENVIRONMENTAL STATEMENT

LEGEND:

ALLOTMENT NAMES AND NUMBERS

(1) BAR X
(2) FISH CREEK
(3) GOLD CREEK
(4) LITTLE SANDY-LITTLE PROSPECT
(5) STEAMBOAT MOUNTAIN
(6) LITTLE COLORADO
(7) RED DESERT
(8) BUSH RIM
(9) CONTINENTAL PEAK
(10) PACIFIC CREEK
(11) SANDS
(12) WHITE ACORN
(13) PROSPECT MOUNTAIN
(14) RESERVOIR
(15) POSTON
(16) PINE CREEK

ALLOTMENT AND USE AREA BOUNDARIES
PASTURE BOUNDARIES
C-12 CUSTODIAL PASTURES
NO LIVESTOCK GRAZING
FOREST SERVICE WITHDRAWAL
FISH AND WILDLIFE SERVICE WITHDRAWAL



LEGEND

GOOD

FAIR

POOR

Scale 1 : 500,000
1 inch equals approximately 8 miles

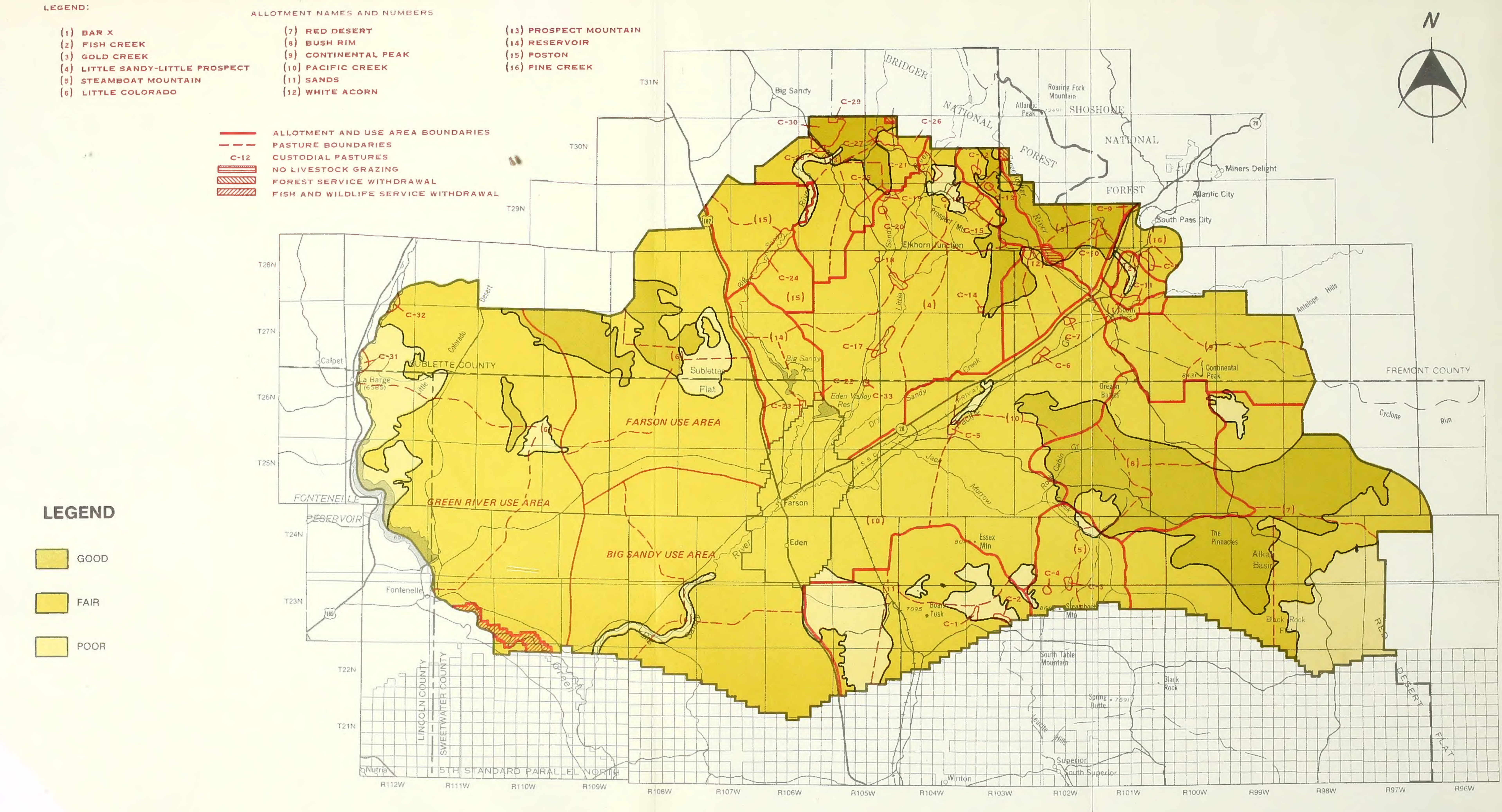
10 0 10 20 Miles

10 0 10 20 Kilometers

SANDY AREA BOUNDARY

FUTURE RANGE CONDITION — CATTLE AND HORSES, YEAR 2000

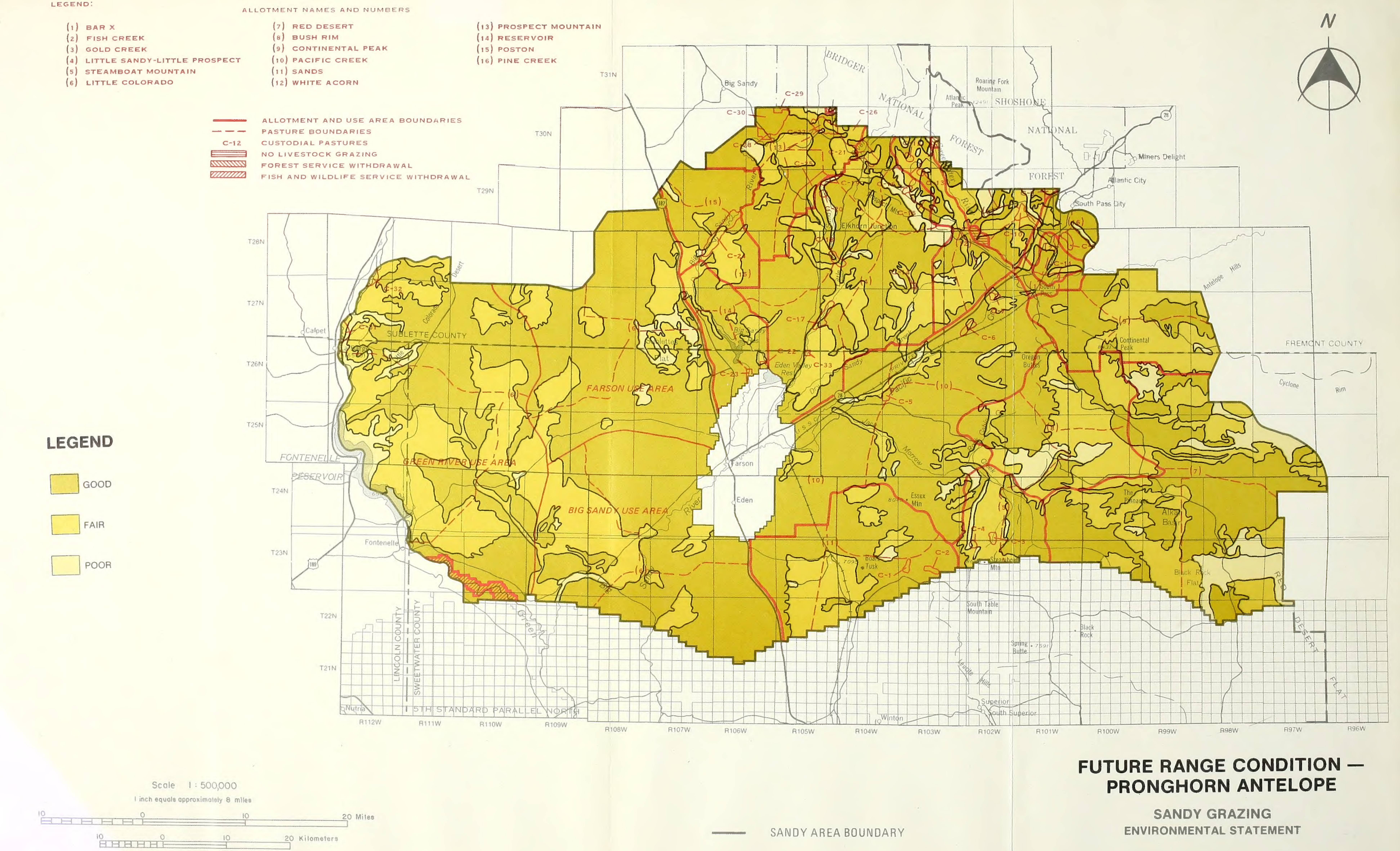
SANDY GRAZING
ENVIRONMENTAL STATEMENT



FUTURE RANGE CONDITION - SHEEP, YEAR 2000

SANDY GRAZING ENVIRONMENTAL STATEMENT

MAP 2-39



FUTURE RANGE CONDITION — PRONGHORN ANTELOPE

SANDY GRAZING
ENVIRONMENTAL STATEMENT

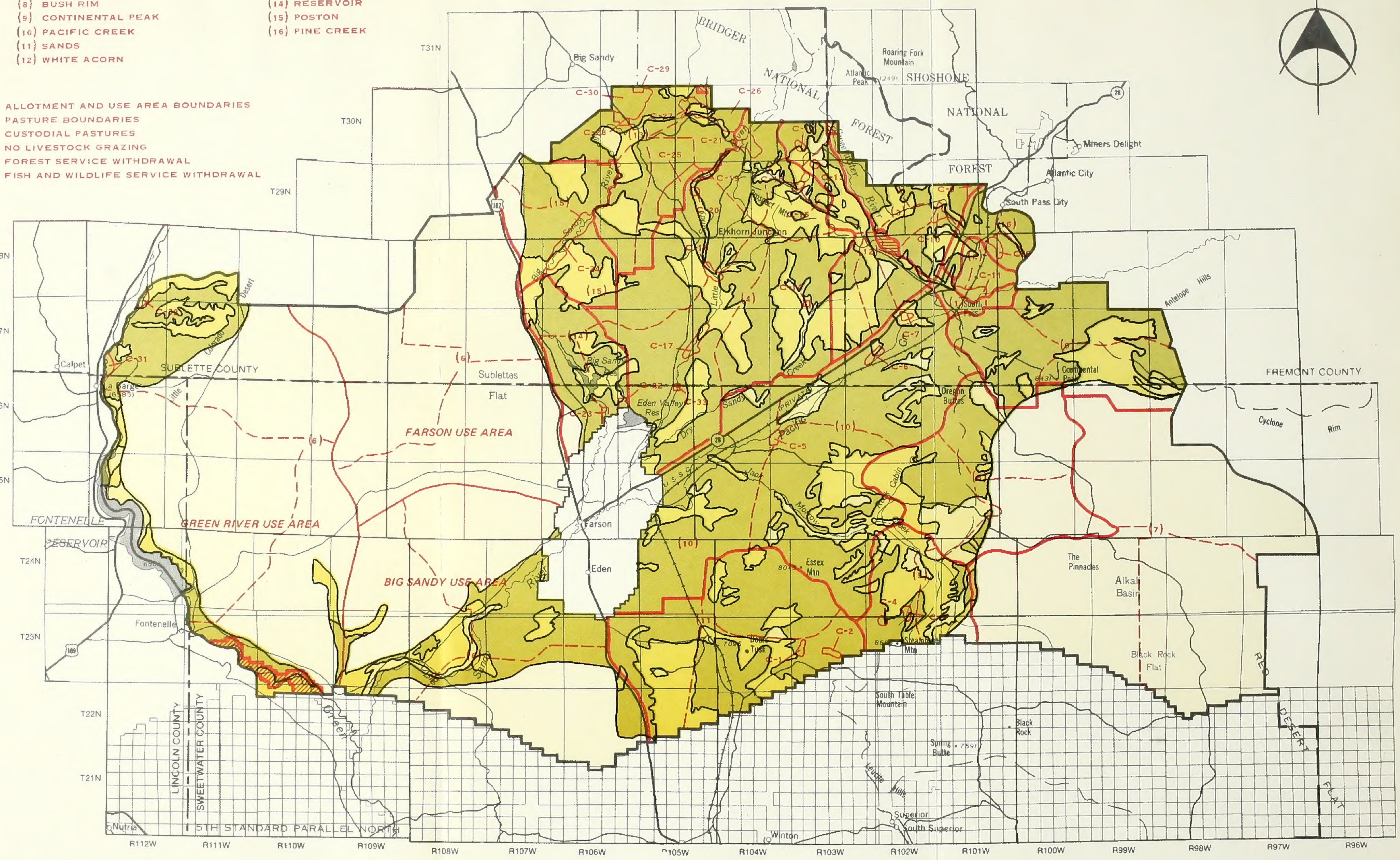
MAP 2-40

LEGEND:

ALLOTMENT NAMES AND NUMBERS

(1) BAR X
(2) FISH CREEK
(3) GOLD CREEK
(4) LITTLE SANDY-LITTLE PROSPECT
(5) STEAMBOAT MOUNTAIN
(6) LITTLE COLORADO
(7) RED DESERT
(8) BUSH RIM
(9) CONTINENTAL PEAK
(10) PACIFIC CREEK
(11) SANDS
(12) WHITE ACORN
(13) PROSPECT MOUNTAIN
(14) RESERVOIR
(15) POSTON
(16) PINE CREEK

ALLOTMENT AND USE AREA BOUNDARIES
PASTURE BOUNDARIES
C-12 CUSTODIAL PASTURES
NO LIVESTOCK GRAZING
FOREST SERVICE WITHDRAWAL
FISH AND WILDLIFE SERVICE WITHDRAWAL



LEGEND

GOOD

FAIR

POOR

MARGINAL

Scale 1 : 500,000

1 inch equals approximately 8 miles

10 0 10 20 Miles

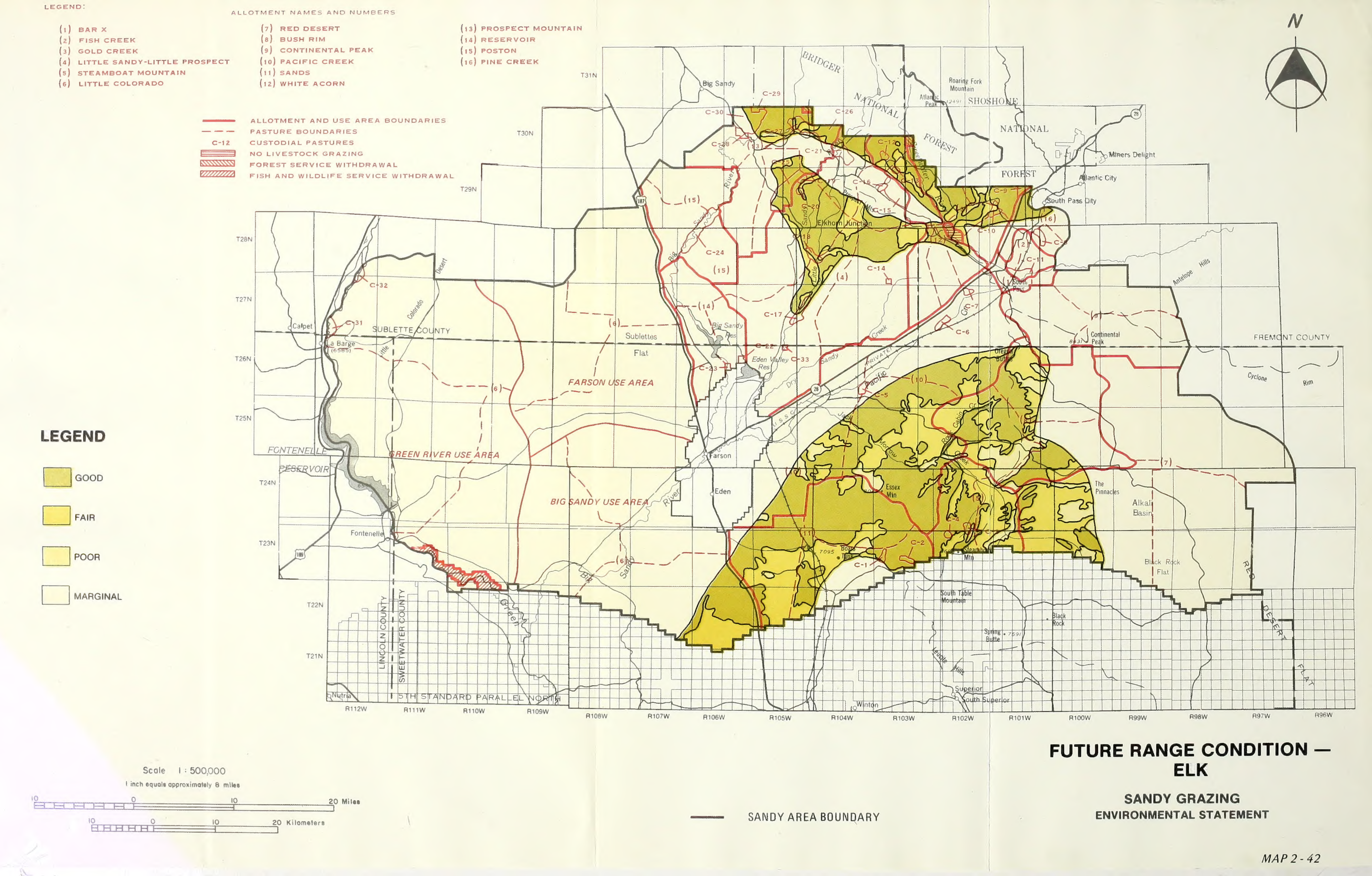
10 0 10 20 Kilometers

SANDY AREA BOUNDARY

FUTURE RANGE CONDITION — MULE DEER

SANDY GRAZING ENVIRONMENTAL STATEMENT

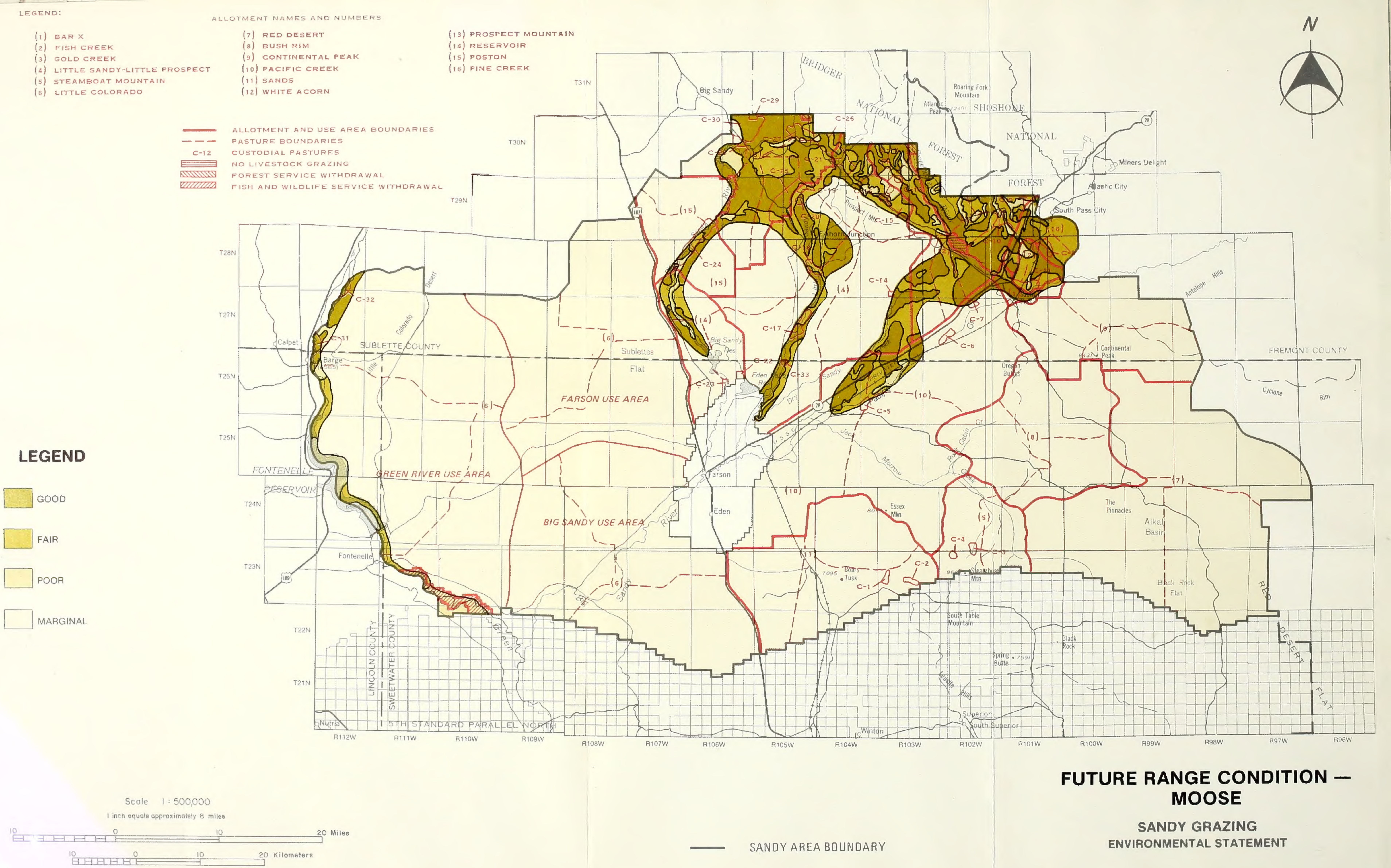
MAP 2-41



FUTURE RANGE CONDITION — ELK

SANDY GRAZING ENVIRONMENTAL STATEMENT

MAP 2-42



FUTURE RANGE CONDITION — MOOSE

SANDY GRAZING ENVIRONMENTAL STATEMENT

MAP 2-43

CHAPTER 3

ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

This chapter analyzes impacts on the existing environment's resources and land uses (Chapter 2) that would be significantly impacted by implementation of the proposed action as described in Chapter 1. Analysis indicates there would be no significant impacts on air quality, climate, geology, topography, and mineral resources as a result of the proposed action.

Analysis of the impacts is in two stages: short term and long term. For the purposes of short-term analysis, all impacts are treated as though they occurred within eleven years following completion of the environmental statement. In reality, those impacts would begin with the implementation of the range improvement projects and occur throughout the entire eleven-year period. This includes eight years to implement the proposed action and three years to complete one grazing cycle in all allotments. Analysis of short-term impacts takes into consideration the first application of the grazing treatments (first grazing cycle) and their singular impact on the environmental elements.

Long-term impacts would occur during the following twelve years. This is the estimated time it would take to realize anticipated benefits of the proposed action. These impacts are analyzed as though they occurred 23 years after the completion of this statement. They are considered under the grazing systems analysis of each section to limit repetition and provide for a systematic flow of the analysis. Cumulative impacts are considered in the long-term analysis. TABLE 3-65, located at the end of this chapter, summarizes the long-term impacts of the proposed action.

ASSUMPTIONS AND ANALYSIS GUIDELINES

Certain assumptions have been made in the analysis of the proposed action's impacts on various environmental elements. The following are general assumptions; specific assumptions for individual resources are included in the respective sections.

1. Wild horses in the Sandy area would be reduced in numbers as specified in the draft wild horse unit management plans. This would result in an average of 800 wild horses in the area. The Little Colorado Unit would have a maximum of 200 and a minimum of 100 horses for an average of 150 head, while the Continental Peak Unit would have a maximum of 750 and a minimum of 550 horses for an average of 650 head.

2. Wildlife habitat management is considered at two levels: the current populations and the desired populations established by the Wyoming Game and Fish Department. Impact analysis is based on the present population. A comparative evaluation is also made between the present and desired population levels.

3. Construction activity would occur from April through November during the years that the proposed range improvements are made.

4. Use of the private and state lands intermingled with the public lands and currently grazed in common with public land would continue. Analysis of impacts in Chapters 3 and 8 include public, private and state lands, although no attempt was made to separate impacts. Current livestock use of the fenced private lands and custodial pastures would remain essentially the same after implementation of the proposed action. The lands are being used for hay production, grazing or other activities associated with grazing operations.

5. All increased forage production in the long term will be allocated to livestock, wildlife, and wild horses, as appropriate.

Guidelines for analysis of impacts of the proposed action include the estimated acres disturbed, manpower required, estimated costs, and time required to complete range improvements (see TABLE 3-1).

IMPACT ANALYSIS

SOILS

Sheet Erosion

Anticipated increases in total ground cover from implementation of the proposed grazing systems (see vegetation section) would reduce the estimated sheet erosion rate in the Sandy area by 1,452,657 tons per year from 8,378,610 (TABLE 2-3) to approximately 6,925,953 tons per year in 23 years (TABLE 3-2). No measurable short-term reductions in sheet erosion are expected, based on an analysis of ground cover projections for the eleven-year period.

Long-term reductions would vary in the proposed allotments (TABLE 3-2), depending upon the soil associations present. Pasture level detail by mapping unit is available upon request from the Rock Springs District Office. It is estimated that sheet erosion would continue

TABLE 3-1

ESTIMATED ACRES DISTURBED, MANPOWER REQUIREMENTS, AND ESTIMATED COSTS FOR CONSTRUCTION OF PROPOSED RANGE IMPROVEMENTS

Improvement	Total Units	Cost Per Unit Installed	Total Cost	Acres Disturbed Per Unit	Total Acres Disturbed	Manpower Per Unit	Total Manpower Requirement (Man-Days)
Water Developments							
Springs (include fencing, stock tanks, storage tanks, and pipelines)	6	$3,000	$18,000	0.350	2	2 for 2 weeks	120
Wells (include stock tanks, storage tanks, and pipelines)	39	$25,000	$975,000	0.400	15	3 for 4 weeks	2,340
Pipelines (include stock tanks every 2 miles)	20 mi	$2,500	$50,000	1/mi	20	5 for 1 day	100
Pit reservoirs	33	$2,000	$66,000	1.200	40	3 for 2 days	198
Earthfill reservoirs	63	$5,000	$315,000	3.450	217	3 for 3 days	567
Water fencing (3-strand barbed wire*	25 mi	$3,400	$81,600	1/mi	25	2 for ½ day	24
Two-track access trails**	62 mi	None	None	1/mi	62		
Fences							
Three-strand barbed wire	265 mi	$2,100	$556,500	1/mi	265	2 for ½ day	265
Four-strand barbed wire	271 mi	$2,500	$677,500	1/mi	271	2 for ½ day	271
Removal of existing fence	5 mi	$100	$500	1/mi	5	2 for ½ day	5
Cattleguards	75	$1,600	$120,000	0.005	1	2 for 3 days	450
TOTALS			$2,860,100		923		4,340

* One mile of water fencing included under costs for springs.
** No additional manpower would be necessary for access trails to water developments.

TABLE 3-2

PREDICTED LONG-TERM SHEET EROSION UNDER PROPOSED ACTION

Allotment	Acres	Geologic Erosion in Tons/Yr.	Other Sheet Erosion in Tons/Yr.	Total Sheet Erosion in Tons/Yr.	Change From Existing Rate in Tons/Yr. 1/
Bar X	6,895	6,330	2,416	8,746	-5,980
Fish Creek	7,237	6,643	5,515	12,158	-4,611
Gold Creek	30,525	28,023	24,648	52,671	-8,628
Little Sandy-Little Prospect	185,660	168,437	308,859	477,296	-166,293
Steamboat Mountain	40,537	37,213	586,690	623,903	-61,421
Little Colorado:					
Green River Use Area	303,791	278,881	283,816	562,697	-167,415
Farson Use Area	205,123	188,302	387,939	576,241	-145,220
Big Sandy Use Area	218,042	200,163	367,449	567,612	-151,043
Red Desert	245,375	225,254	345,937	571,191	-62,894
Bush Rim	104,547	95,974	578,753	674,727	-124,915
Continental Peak	88,478	81,223	466,164	547,387	-93,875
Pacific Creek	202,856	186,223	979,487	1,165,710	-256,373
Sands	114,852	105,434	391,042	496,476	-44,708
White Acorn	46,794	42,956	99,811	142,767	-34,376
Prospect Mountain	66,751	61,276	117,885	179,161	-57,667
Reservoir	35,545	32,631	51,154	83,785	-20,946
Poston	50,635	46,483	109,911	156,394	-41,615
Pine Creek	14,089	12,934	14,097	27,031	-4,677
TOTALS	1,967,732	1,804,380	5,121,573	6,925,953	-1,452,657

1/Difference between the total sheet erosion in tons per year in this table and that under the existing environment as shown in TABLE 2-3.

at existing rates in the custodial management pastures (TABLE 2-3) and the Palmer Draw no grazing area since no change in the existing management is proposed.

The Musgrave Equation was used to compute the changes in sheet erosion rates (see APPENDIX 2B). These calculations depended largely upon the projected long-term increases in litter accumulation and canopy cover (TABLE 3-14), which were used to adjust the ground cover factor in the equation. APPENDIX 2B outlines how these calculations were made. Geologic erosion rates would remain the same during the short and long terms since this type of erosion is caused by natural factors on which man's activities have little or no influence (TABLES 2-3 and 3-2).

An analysis of soils in the area indicates that Mapping Units 132, 233, and 333 (TABLE 2-3 and MAP 2-3) are subject to high rates of erosion despite the proposed grazing systems because of their characteristics, i.e., location on steep slopes and sparse vegetal cover. These soils erode at rates six to eight times greater than those of the next lower mapping unit rates. Pasture level analysis by mapping unit is available upon request from the Rock Springs District Office.

These soils in the Steamboat Mountain (23,055 acres), Bush Rim (24,790 acres), Continental Peak (11,372 acres), and Pacific Creek (29,413 acres) allotments cover areas which represent 57, 24, 13, and 14%, respectively, of the total acres within these allotments (TABLE 2-3). These soils would contribute to continuing high rates of sheet erosion in these areas, although the rates would be slightly reduced. These mapping units include an estimated 95,000 acres of the Sandy area. This is less than 5% of the acres on which improved management procedures would be implemented within the Sandy area.

The largest increases in total ground cover are anticipated on mapping units with a sagebrush-grass vegetation type on slopes of 4 to 14%. These units would be expected to have the greatest reductions in sheet erosion. Mapping Units 217, 220, 221, 222, 223, 224, 225, and 228 (MAP 2-3) cover more than 32% (644,670 acres) of the area. Detailed analysis of these areas by pasture is available upon request from the Rock Springs District Office.

In the saline and alkaline soils of Mapping Units 111, 113, 115, 117, and 126 (APPENDIX 2A and MAP 2-4), only slight reductions in sheet erosion would be expected due to slight increases in ground cover and nearly level slopes. Very little change in sheet erosion would be expected on soils in forested areas, mountain meadows, and stable sand dunes because the proposed livestock use would have very little effect on the ground cover in these areas. Exact amounts of reduction for various mapping units by pasture are available for review upon request from the Rock Springs District Office.

Using the guidelines for acceptable average erosion by allotment (Soil Conservation Service 1973), it was found that 373,414 acres would remain in the excessive erosion category of more than 5 tons per acre per year (TABLE 3-3). This is 19% of the 1,967,732 acres on which improved management procedures would be implemented. These allotments have large areas of Mapping Units 132, 233, and 333 (TABLE 3-3 and MAP 2-3). These mapping units would be expected to erode at the present high levels.

Moderate erosion would occur on 1,098,560 acres. This is 56% of the acres on which improved management procedures would be implemented and is a reduction of 319,205 acres or 23% from the present situation of 1,417,765 acres (TABLE 2-4). The reduction in acres under the excessive and moderate sheet erosion is reflected in a 26% increase in the light erosion category acreage from 365,425 acres (TABLE 2-5) to 495,758 acres (TABLE 3-3).

An exception to the expected general reduction of erosion is the areas where construction of reservoirs would occur and where reservoirs would receive increased livestock use around them, causing trampling of the vegetation and soil compaction. Construction activities would also cause areas of bare ground. The actual area involved is approximately 923 acres (TABLE 3-1), or less than 1% of the Sandy area. Runoff around reservoirs would increase sediment entering them. This would significantly reduce the life expectancy of reservoirs without maintenance to remove the accumulated sediment.

Actual bare ground remaining after an earthfill or pit reservoir has filled would be approximately 0.95 and 0.7 of an acre, respectively. This includes areas approximately 51 feet from the edge of the water for earthfill reservoirs and 46 feet for pit reservoirs. Most reservoirs would be constructed on alluvial type soils which are generally deep, fine sandy loams. Using the Musgrave Equation (APPENDIX 2B), sheet erosion rates were based on the following average conditions: (1) 33 percent slope (3:1 slope); (2) bare ground vegetation figure (APPENDIX 2B); and (3) a 0.4-inch, 30-minute rainfall every two years. The sheet erosion rate is 7.58 tons per acre per year for an earthfill reservoir and 7.31 tons per acre per year for a pit reservoir. This would be 7.2 tons per year for each earthfill reservoir and 5.1 tons per year for each pit reservoir for a total of 622 tons per year erosion for these proposed developments. This would be an insignificant amount when compared to the sheet erosion for the Sandy area, but it would be significant when related to the life expectancy of the reservoirs. Vegetation disturbed by vehicles traveling over the two-track access trails during construction and maintenance of the water developments and during fence construction would not significantly increase sheet erosion. The sheet erosion that reaches perennial streams and reservoirs would continue to reduce water quality and impair habitat and cultural values.

Wind Erosion

Wind erosion is expected to respond inversely to the ground cover factor (Humphrey 1962). Since total cover would be expected to increase, the amount of wind erosion would be expected to decrease. The amount of decreased wind erosion is not quantifiable at this time.

TABLE 3-3

EROSION BY CLASS UNDER PROPOSED ACTION

Allotment	Light Erosion Class* Existing 1/ Acres	Projected Acres2/	Acres Change From Existing	Moderate Erosion Class* Existing Acres	Projected Acres2/	Acres Change From Existing	Excessive Erosion Class* Existing Acres	Projected Acres2/	Acres Change From Existing
Bar X	4,771	6,895	+2,124	2,124	0	-2,124	0	0	0
Fish Creek	0	7,237	+7,237	7,237	0	-7,237	0	0	0
Gold Creek	15,253	30,525	+15,272	15,272	0	-15,272	0	0	0
Little Sandy-Little Prospect	0	29,628	+29,628	185,660	156,032	-29,628	0	0	0
Steamboat Mountain	0	0	0	0	0	0	40,537	40,537	0
Little Colorado: Green River Use Area	84,513	201,689	+117,176	219,278	102,102	-117,176	0	0	0
Farson Use Area	0	0	0	205,123	205,123	-117,176	0	0	0
Big Sandy Use Area	0	68,199	+68,199	218,042	149,843	-68,199	0	0	0
Red Desert	0	80,717	+80,717	245,375	164,658	-80,717	0	0	0
Bush Rim	0	0	0	32,533	32,533	0	72,014	72,014	0
Continental Peak	0	0	0	0	0	0	88,478	88,478	0
Pacific Creek	0	0	0	68,457	68,457	0	134,399	134,399	0
Sands	0	0	0	38,694	76,866	+38,172	76,158	37,986	-38,172
White Acorn	0	7,622	+7,622	38,746	39,172	+426	8,048	0	-8,048
Prospect Mountain	0	23,361	+23,361	66,751	43,390	-23,361	0	0	0
Reservoir	10,932	10,932	0	24,613	24,613	0	0	0	0
Poston	14,864	14,864	0	35,771	35,771	0	0	0	0
Pine Creek	0	14,089	+14,089	14,089	0	-14,089	0	0	0
TOTAL	130,333	495,758	+365,425	1,417,765	1,098,560	-319,205	419,634	373,414	-46,220
(Percent Change from Existing)			(+380%)			(-23%)			(-11%)

*Light - less than 2 tons per acre per year; Moderate - 2 to 5 tons per acre per year; Excessive - greater than 5 tons per acre per year. Average acres of erosion by pasture is available for review upon request from the Rock Springs District Office.

1/ From TABLE 2-4.

2/ Projected acres of this erosion class under the proposed action.

Compaction

Using a technique similar to the one used in the soil compaction portion of Chapter 2 and APPENDIX 2D, the relative degree of seasonal grazing intensity by livestock under the proposal was estimated (TABLE 3-4). TABLE 3-5 portrays the expected relative degree of grazing intensity after eleven and 23 years. The table shows an increase in acres effectively used (acres in light, moderate, heavy, and severe intensity classes) by livestock from 918,373 acres presently (TABLE 2-6) to 1,020,312 acres (11%) after eleven years and to 1,128,139 acres (23%) after 23 years (TABLE 3-5). These increases would be largely a result of the increased availability of water that would be supplied with the proposed water developments. It is also assumed that with increased livestock use around waters the livestock would eventually be forced to travel farther from water to obtain forage. This assumption was based on the generally accepted and stated conclusion that grazing systems increase distribution and/or provide more uniform use (Stoddart, Smith, and Box 1975). Areas presently not being grazed or lightly grazed would receive more use because of the increased waters under the proposal. Livestock use would be reflected by the assumption that use would occur over an "increased distance from water"

The present high use areas would tend to have a lower average concentration of use due to the rest provided by the grazing system, thus less compaction. This effect was found in studies of continuous use, rotation, and rest-rotation conducted on the Medicine Bow National Forest (Johnson 1965). The average utilization on meadows in this study was reduced by 36% under the rest-rotation systems with a reduction in livestock AUMs. This relationship can also be seen by comparing seasonal use in TABLE 3-4 with short and long term use in TABLE 3-5. The estimated total acreage for the Sandy area in the heavy and severe compaction use categories in the long term would increase from 44,729 acres to 63,389 acres of heavy use and from 17,129 acres to 23,826 acres of severe use (TABLE 3-5). These represent increases of 42% and 40%, respectively, from the short to the long terms since the numbers of livestock proposed on improved management areas would be much higher at the end of 23 years than during the short term use. However, the predicted increase in ground cover with the implementation of the proposed action (TABLE 3-14) would partially reduce the compaction from increased livestock use by dissipating the destructive force of water during runoff and allowing more time for the water to enter the soil.

The proposed livestock use would be much greater in the Little Colorado, Red Desert, and Sands Allotments than presently occurring, thus causing heavier utilization of forage around the limited water sources. This would result in severe and heavy compaction because of poor livestock distribution. FIGURE 3-1 shows the relative amount of use in each of the compaction categories.

Summary of Impacts

Despite the continued high erosion rates in those areas with Mapping Units 132, 233, and 333, the Sandy area's sheet erosion rate would be reduced 1,452,657 tons per year from 8,378,610 tons per year (TABLE 2-3) to a total of approximately 6,925,953 tons per year (TABLE 3-2) due to anticipated increases in total ground cover during the 23-year timeframe. About 622 tons per year would be lost to sheet erosion as a result of construction of earthfill and pit reservoirs under the proposed action.

This reduced erosion would mean more valuable topsoil would remain in place. The increased ground cover would increase the amount of water that would enter and remain in the soil. Retention of the topsoil would provide a more ideal medium for plant growth than subsurface layers. (In the Sandy area, subsurface layers may contain toxic quantities of salts, impenetrable layers of lime, or partially decomposed bedrock which would hamper plant growth.)

The sheet erosion that reaches perennial streams and reservoirs would continue to reduce water quality and impair aquatic habitat and cultural values.

While wind erosion rates would also be reduced by the ground cover, the amount of reduction cannot be quantified at this time.

WATER RESOURCES

Water Use

Water consumption from reservoirs by livestock under the proposed grazing systems would be 116 acre-feet per year during the short term and 152 acre-feet per year at the end of the long term (TABLE 3-6). This would be an increase of 37 acre-feet and 73 acre-feet, respectively, excluding evaporation, above existing livestock water use levels (TABLE 3-6). The increase in consumptive use by livestock would be due to an increase in their numbers and available water developments.

Present stock water depletions in the Green River Basin total 2,000 acre-feet per year (Wyoming State Engineer's Office 1973). The effect of the additional water consumption by livestock on the basin is negligible. Water consumption within custodial pastures would not change because livestock use would not be expected to change under the proposed action. Water use by livestock in Palmer Draw would be reduced to zero since this is a no grazing area. However, water use by wildlife could increase in Palmer Draw.

The evaporation losses, including losses to groundwater, from the 96 proposed reservoirs and pits would be 418 acre-feet per year in 23 years (TABLE 3-7). Evaporation losses in the Green River Basin total 26,300 acre-feet per year (Wyoming State Engineer's Report 1973). The evaporation losses from the proposed action would be a 2% increase in water loss in the basin. Total evaporation loss from livestock reservoirs in the Sandy area would be 1,294 acre-feet in the long term.

TABLE 3-4

PROJECTED ACREAGES OF SEASONAL GRAZING
INTENSITY BY ALLOTMENT UNDER PROPOSED ACTION

Allotment	Marginal to Slight	Light	Moderate	Heavy	Severe	Total
Bar X	212	5,043	1,166	346	128	6,895
Fish Creek	0	3,331	2,787	800	319	7,237
Gold Creek	0	15,589	10,819	2,964	2,964	30,525
Little Sandy-Little Prospect	27,700	114,186	31,616	9,085	3,073	185,660
Steamboat	22,949	15,312	1,722	409	145	40,537
Little Colorado: Green River Use Area	181,460	69,143	37,190	357	4,641	303,791
Farson Use Area	101,102	62,099	30,132	8,563	3,227	205,123
Big Sandy Use Area	91,991	87,206	28,473	7,442	2,930	218,042
Red Desert	169,148	26,933	31,939	12,718	4,637	245,375
Bush Rim	31,061	56,920	12,116	3,390	1,060	104,547
Continental Peak	30,115	39,333	13,467	4,192	1,371	88,478
Pacific Creek	44,925	127,201	22,446	6,159	2,125	202,856
Sands	55,728	48,846	7,956	1,698	624	114,852
White Acorn	4,063	23,321	14,037	3,989	1,384	46,794
Prospect Mountain	5,431	46,893	10,545	2,980	974	66,751
Reservoir	7,966	21,342	4,409	1,361	467	35,545
Poston	2,435	36,791	7,941	2,598	870	50,635
Pine Creek	623	10,100	2,481	668	217	14,089
TOTALS*	776,909	809,589	271,242	80,647	29,345	1,967,732
GRAND TOTAL						1,967,732

Marginal = Those acres normally too distant from water to be grazed.
Slight = Those acres normally within reach of water, but grazed at an intensity of less than 75 acres/AUM.
Light = Grazing intensity from 16 to 75 acres/AUM.
Moderate = Grazing intensity from 5.5 to 16 acres/AUM.
Heavy = Grazing intensity from 2 to 5.5 acres/AUM.
Severe = Grazing intensity less than 2 acres/AUM.

NOTE: Seasonal reflects the maximum number of AUMs grazed any one year in a particular allotment taking into account the grazing system being used.

* Pasture level analysis is available upon request from the Rock Springs District Office.

TABLE 3-5

PROJECTED ACREAGES OF SHORT-TERM AND LONG-TERM GRAZING INTENSITY BY ALLOTMENT UNDER PROPOSED ACTION

	Short-Term Mean[2/]					Long-Term Mean[2/]				
Allotment	Marginal* to Slight*	Light*	Moderate*	Heavy*	Severe*	Marginal* to Slight*	Light*	Moderate*	Heavy*	Severe*
Bar X	212	5,043	1,166	346	128	63	4,937	1,339	416	140
Fish Creek	165	5,329	1,267	354	122	0	5,248	1,407	434	148
Gold Creek	1,623	22,086	4,965	1,337	514	0	19,831	7,629	2,250	815
Little Sandy-Little Prospect	53,648	106,353	19,537	4,495	1,627	45,074	107,903	24,453	5,985	2,245
Steamboat Mountain	22,949	15,312	1,722	409	145	19,351	17,888	2,495	592	211
Little Colorado:										
Green River Use Area	181,459	91,558	21,379	6,321	3,074	181,461	69,172	37,433	10,883	4,842
Farson Use Area	107,522	70,214	20,315	5,201	1,871	101,103	63,462	28,529	9,021	3,008
Big Sandy Use Area	111,548	82,747	17,226	4,717	1,804	95,933	90,365	22,298	6,829	2,617
Red Desert	169,069	43,326	22,936	7,395	2,649	169,149	38,135	25,659	9,082	3,350
Bush Rim	46,261	49,156	6,701	1,779	650	34,967	56,190	10,142	2,318	930
Continental Peak	36,496	40,438	8,570	2,175	799	31,875	43,207	10,209	2,300	887
Pacific Creek	84,763	99,894	13,701	3,224	1,274	63,547	116,087	17,431	4,269	1,522
Sands	73,922	35,446	4,113	1,035	336	56,325	48,190	8,062	1,663	612
White Acorn	7,418	29,121	7,372	2,171	712	6,579	29,613	7,615	2,228	759
Prospect Mountain	23,046	35,722	6,060	1,425	498	15,674	40,647	7,844	1,949	637
Reservoir	13,715	17,730	3,122	693	285	9,583	21,286	3,419	929	328
Poston	10,896	32,464	5,452	1,305	518	7,498	34,461	6,319	1,765	592
Pine Creek	2,708	9,595	1,316	347	123	1,411	10,128	1,891	476	183
Totals[1/]	947,420	791,534	166,920	44,729	17,129	839,593	816,750	224,174	63,389	23,826

*Marginal - Those acres generally too distant from water to be grazed.
Slight - Those acres within reach of water but grazed at an intensity greater than 75 acres/AUM.
Light - Grazing intensity from 16 to 75 acres/AUM.
Moderate - Grazing intensity from 5.5 to 16 acres/AUM.
Heavy - Grazing intensity from 2 to 5.5 acres/AUM.
Severe - Grazing intensity less than 2 acres/AUM.

1/ Pasture level analysis is available upon request from the Rock Springs District Office.

2/ Average of the acres used over an allotment grazing cycle.

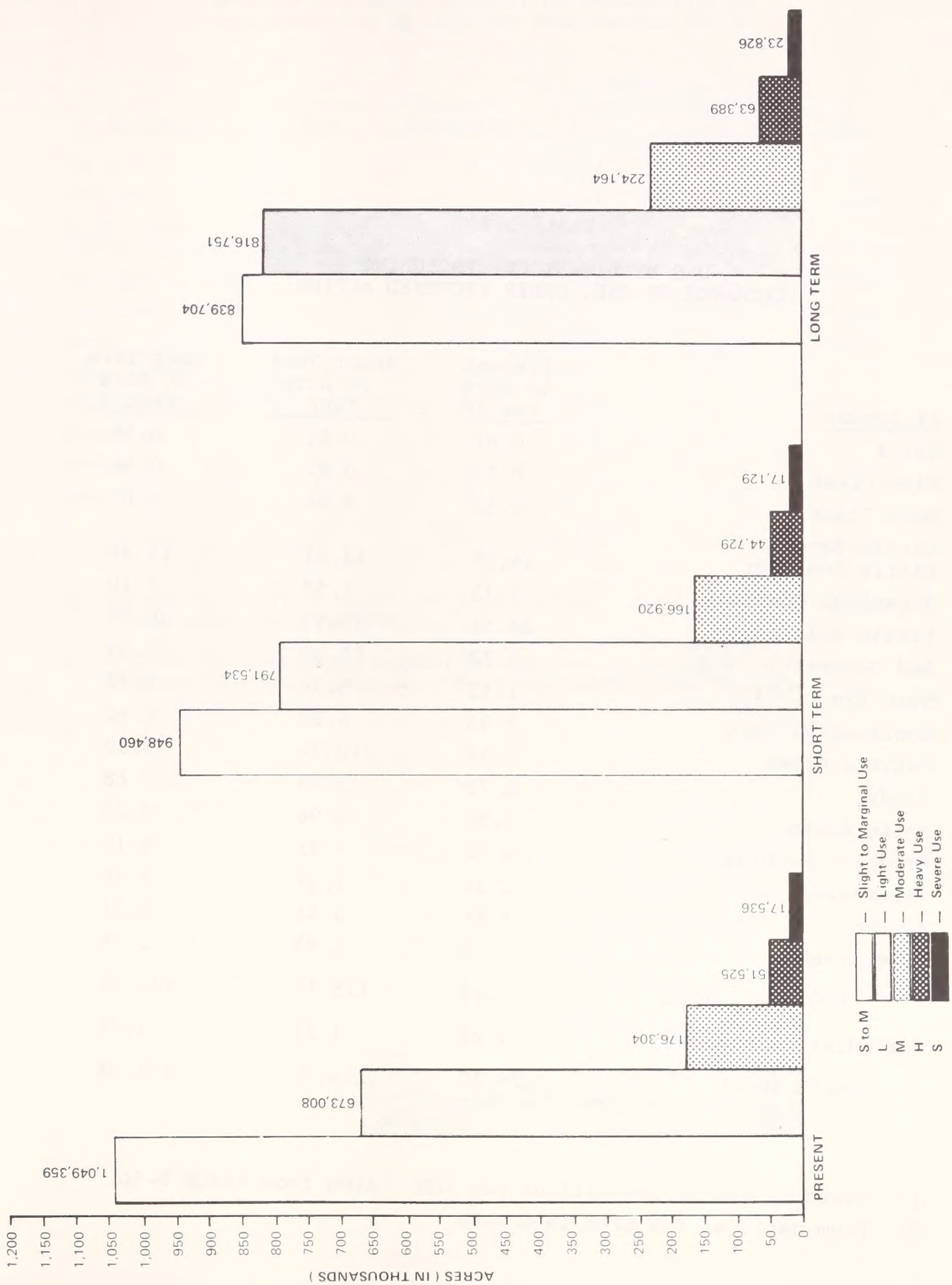


FIGURE 3 - 1 Grazing Intensity Under the Proposed Action

TABLE 3-6

USE BY LIVESTOCK, INCLUDING
EXCHANGE OF USE, UNDER PROPOSED ACTION

Allotment	Present in Acre Feet1/	Short Term in Acre Feet 1/	Long Term in Acre Feet 1/
Bar X	0.87	0.81	0.88
Fish Creek	0.73	0.82	0.96
Gold Creek	3.52	3.24	5.05
Little Sandy-Little Prospect	14.28	11.61	15.84
Steamboat Mountain	1.15	1.57	2.10
Little Colorado	28.51	39.95	58.31
Red Desert	3.22	15.40	17.51
Bush Rim	1.13	5.36	6.78
Continental Peak	3.33	6.03	6.42
Pacific Creek	5.98	10.74	13.00
Sands	2.78	3.73	5.68
White Acorn	2.53	4.96	5.21
Prospect Mountain	4.08	4.31	5.14
Reservoir	2.34	2.17	2.30
Poston	2.81	3.41	4.21
Pine Creek	.72	1.03	1.35
ALLOTMENT TOTALS	77.98	115.14	150.74
Custodial Pastures2/	1.22	1.22	1.22
GRAND TOTAL	79.20	116.36	151.96

1/ Based on use of 300 gallons per AUM. AUMs from TABLE 2-70.

2/ From national resource land AUMs.

TABLE 3-7

INCREASED EVAPORATION LOSSES BY THE PROPOSED PITS AND RESERVOIRS OVER THE LONG-TERM UNDER PROPOSED ACTION

Allotment	Number of Proposed Pits	Number of Proposed Reservoirs	Evaporation Losses (Acre-Feed)1/ Pits	Evaporation Losses (Acre-Feed)1/ Reservoirs	Evaporation Losses (Acre-Feed)1/ Total
Bar X	2	0	2.98	0	2.98
Fish Creek	1	0	1.49	0	1.49
Little Sandy-Little Prospect	10	24	14.90	140.64	155.54
Steamboat Mountain	3	2	4.47	11.72	16.19
Continental Peak	0	3	0	17.58	17.58
Sands	11	1	16.39	5.86	22.25
White Acorn	0	9	0	52.74	52.74
Prospect Mountain	1	12	1.49	70.32	71.81
Reservoir	2	3	2.98	17.58	20.56
Poston	3	8	4.47	46.88	51.35
Pine Creek	0	1	0	5.86	5.86
TOTALS2/	33	63	49.17	369.18	418.35

1/ Reservoir evaporation rate = 5.86 acre-feet/year. Pit evaporation rate = 1.49 acre-feet/year (APPENDIX 2E).

2/ No water developments are proposed for the custodial pastures and Palmer Draw area; therefore, there would be no evaporation losses for these areas.

Streamflow

The proposed grazing systems would have an unmeasurable effect on streamflow in perennial streams within or downstream from the Sandy area. Mean annual runoff from the Sandy area is estimated at 0.3 inches per year (Smith 1974). Mean annual runoff from the mountainous areas above the Sandy area is estimated at 10 inches per year (McGuinnes 1964); therefore, changes in runoff from the proposed action would have no measurable effect on annual perennial streamflow.

Impacts of the proposed action on streamflow are based on the assumption that short-term average annual precipitation would remain near 7 to 12 inches per year over the long term. A long, dry period such as occurred from 1959 to 1963 (FIGURE 2-9) or a wet period such as occurred from 1944 to 1949 would affect the magnitude of impacts, as would a major storm event in any year.

Continuation of present use levels of surface water is also assumed, although energy and mineral development in Wyoming has increased the demand for surface waters. Several new projects have been proposed, including new dam sites and transbasin diversions of Green River water to eastern Wyoming (see Chapter 2 Future Environment, Water Resources). There is a possible development proposed in the area (per. comm., Allen 1978). Since it is impossible to predict the legal and political constraints placed on surface water, the present utilization assumption was necessary for analysis of the proposed action.

Storm runoff from a ten-year storm event model would decrease below existing levels in the Sandy area at the end of both the short term and long term by 7% and 29%, respectively (TABLE 3-8). This decrease would be due to increased infiltration rates during Treatment C, rest season long (Gifford and Hawkins 1976), and a projected long term increase in vegetal cover (see vegetation TABLE 3-14).

Storm runoff values were calculated on model basins within the Sandy area. Input to these models were allotment mean infiltration rates by vegetation types, allotment mean vegetation conditions, and allotment acres by intensity of use class (TABLE 3-5 and APPENDIX 3A). Runoff values reflect relative changes in ten-year storm runoff based on the model basins and applied to the proposed allotments (TABLE 3-8).

Storm runoff would increase above existing levels (TABLE 3-8) during the short term in the Gold Creek, Bush Rim, and White Acorn Allotments. The increases shown may be due to the effects of the runoff model used (APPENDIX 3A). The author states that the model represents only an estimation of runoff, and soil loss and values should never be considered exact. However, storm runoff would decrease in the long term below existing levels because of a projected increase in vegetal cover (TABLE 3-14, vegetation section).

Runoff would increase around proposed water developments. These waters would increase livestock use in areas that are presently grazed lightly. Grazing intensity decreases as the distance from water increases (Mueggler 1965). Infiltration rates would decrease as intensity of livestock use (compaction) increases (Gifford and Hawkins 1976).

Runoff would not change in the custodial pastures as livestock use would not be expected to change. Runoff would decrease in Palmer Draw area as infiltration rates increase as a result of no livestock grazing.

Water Quality

Several fundamental relationships in TABLE 3-9 were used to determine impacts of the proposed action on water quality. The long-term impact of the proposed action on water quality in perennial streams within the Sandy area is not known.

Sediment transported in alluvial streams, particularly sand-sized particles, is dependent on stream power or energy of flowing water (Bagnold 1966). Streams in the Sandy area are alluvial except for a few miles of the Little Sandy and Sweetwater Rivers, which are mountain streams. Stream power for a given stream is related to discharge (Bagnold 1966). As streamflow would not be expected to change, sediment transported in perennial streams would remain unchanged.

Sediment yield in the intermittent streams in the Sandy area would decrease proportionally to the decrease in storm runoff because of increased ground cover (TABLE 3-8). Sediment yield would be anticipated to decrease over the long term by 10% from 1,965,873 tons per year to 1,764,567 tons per year (TABLE 3-10). Sediment yield over the long term would decrease in all allotments except the Sands Allotment, where sediment yield would return to its present level after a short-term decrease because of the increase in livestock use.

Sediment yield would increase proportionally to discharge (FIGURE 2-13). Since only relative changes in runoff were calculated, it is not possible to find actual sediment yield figures under the proposed action.

Sediment yield would increase proportionally to increased runoff (TABLE 3-8) on Gold Creek, Bush Rim, and White Acorn Allotments at the end of the short term because of an increase in runoff. It would decrease below existing levels by the end of the long term because of a projected increase in vegetal cover (TABLE 3-14).

Sediment yield would increase proportionally to the increased runoff around the proposed water developments due to increased grazing intensity (TABLE 3-5). The vegetation disturbed by the two-track trails associated with the water developments and fence construction would not increase sediment yield. Sediment yield would increase downstream from the proposed reservoirs (MAP 1-5) due to headcutting if energy dissipators are not installed.

It is estimated that all 63 earthfill reservoirs would create some degree of headcutting and channel degradation during the project life. It is impossible to quantify whether sediment from the headcutting would be greater than what is trapped by the reservoirs. The soil type (especially alluvial) and peak discharge for each site and the specific design of each reservoir would have to be ana-

TABLE 3-8

MODEL STORM RUNOFF FOR THE PROPOSED ACTION
BY ALLOTMENT IN ACRE-FEET
(10-YEAR STORM)

Allotment	Existing	Short Term	Long Term
Bar X	1.5	1.5	0.5
Fish Creek	0.9	0.9	0.4
Gold Creek	16.5	16.9	13.9
Little Sandy-Little Prospect	45.1	30.9	23.4
Steamboat Mountain	120.8	119.7	97.8
Little Colorado	14.7	14.7	11.2
Green River Area		11.6	8.9
Farson Area		19.2	14.9
Big Sandy Area		14.9	11.3
Red Desert	17.1	14.7	12.3
Bush Rim	66.9	82.1	66.7
Continental Peak	82.9	79.8	63.3
Pacific Creek	58.2	50.4	33.8
Sands	2.0	1.0	2.0
White Acorn	12.8	13.0	8.2
Prospect Mountain	11.4	8.1	5.7
Reservoir	22.9	19.9	13.6
Poston	15.5	13.2	9.2
Pine Creek	2.2	1.9	1.3
Weighted Mean	29.5	27.4	21.0
Percent Change From the Existing Situation		-7%	-29%

TABLE 3-9

IMPACTS OF PROPOSED ACTION ON THE WATER RESOURCE

Constituents	Effect	Impact
Sediment yield	Increase	Increases sediment load
	Decrease	Decreases sediment load
Dissolved chemical	Increase	Degrades chemical quality
	Decrease	Improves chemical quality
Fecal coliform concentrations	Increase	Degrades bacteriological quality
	Decrease	Improves bacteriological quality
Channel stability	Decrease	Decreases sediment load
	Increase	Increases sediment load
Temperature	Increase	Affects fish habitat
	Decrease	Affects fish habitat
Water yield	Decrease	Reduces available water
	Increase	Increases available water

TABLE 3-10

MODEL SEDIMENT YIELD FOR PROPOSED ACTION
BY ALLOTMENT IN TONS PER YEAR

Allotment	Existing Total Sediment Yield	Long Term	Change From Existing Rate
Bar X	4,848	3,193	-1,655
Fish Creek	5,089	3,651	-1,438
Gold Creek	26,423	23,976	-2,447
Little Sandy-Little Prospect	219,021	165,365	-53,656
Steamboat Mountain	37,497	33,472	-4,025
Little Colorado:			
Green River Use Area	337,018	269,007	-68,011
Farson Use Area	234,609	235,100	+491
Big Sandy Use Area	163,872	143,205	-20,667
Red Desert	264,545	224,941	-39,604
Bush Rim	127,417	125,126	-2,291
Continental Peak	79,630	69,196	-10,434
Pacific Creek	176,231	138,071	-38,160
Sands	95,650	95,650	0
White Acorn	43,796	35,560	-8,236
Prospect Mountain	62,370	46,534	-15,836
Reservoir	34,990	27,583	-7,407
Poston	42,961	33,868	-9,093
Pine Creek	9,906	7,810	-2,096
TOTALS	1,965,873	1,681,308	-284,565
Change From Existing Rate		(-14%)	

lyzed to determine the impact of the reservoirs on sediment yield.

Alteration of natural channels during earthfill reservoir construction would also increase channel degradation. Depending on the flow regime and available sediment load, a stream naturally strives toward a state of equilibrium by aggrading or degrading. Thus, a change in the flow regime or sediment discharge would result in changes to the physical characteristics of the channel, increasing or decreasing channel depth, width, or percent slope. A change in physical characteristics would affect sediment discharge (Bagnold 1966). The headcutting vertical slope would be increased in the spillway of earthfill reservoirs when a storm event exceeds the reservoir capacity and the spillway is utilized to pass the excess water. The flow velocity in the spillway is increased over a natural capacity resulting in headcutting and degradation of the channel bottom as the vertical slope is changed.

Site-specific evaluation of each earthfill reservoir and estimation of when headcutting would occur is based on the following variables: (1) storage capacity; (2) storm discharge; (3) sediment load; (4) spillway material; and (5) spillway design. Headcutting would occur when the maximum permissible velocities are exceeded (TABLE 3-11).

Headcuts would be an increased source of sediment to runoff waters. Existing headcuts in the Sandy area vary from a few inches to 20 feet in depth. Once a headcut begins, it continues to erode more area upstream and degrades the channel downstream (FIGURE 3-2). This could occur until the channel depth of the entire watershed has increased significantly (more than 12 inches).

Sediment yield would not change in the custodial pastures as runoff would not be expected to change. Sediment yield in the Palmer Draw area would decrease proportionally to the decrease in runoff due to a decrease in soil compaction by livestock.

Channel stability would increase by 1% in the Sandy area because of the increased rest under the grazing systems. Channel stability is a measure of the amount of erosion occurring in the stream bed. Channel stability was evaluated by determining the relative grazing intensity of livestock (TABLE 3-5), the length of rest of each pasture (Chapter 1), and the channel stability improvement potential (APPENDIX 3B).

Channel stability would decrease in the Gold Creek, Continental Peak, Pacific Creek, Prospect Mountain, and Pine Creek Allotments (TABLE 3-12). This would result from an increase in livestock grazing intensity along streams during the grazing period (TABLE 3-13). Since channel stability and erosion are inversely related, the decrease in channel stability in these allotments would result in an increase in bank erosion.

Channel stability would be expected to decrease or remain static in the custodial pastures, although information is not available on existing channel stability trends in custodial pastures. Channel stability would increase in the Palmer Draw area.

The concentration of dissolved solids (salinity) would decrease during runoff events in intermittent streams within the Sandy area because of a decrease in upland sediments entering intermittent streams. The Soil Conservation Service (1975) has identified rotation grazing, water developments, and channel stabilization as potential improvement programs to reduce sediment and salinity levels in Wyoming streams. Erosion was identified as a major factor in salinity problems. Runoff, erosion, and sediment yield are predicted to decrease under the proposed grazing systems; therefore, salinity levels would decrease.

Elkin (1976) has estimated that the amount of salt is proportional to the amount of sediment, ranging from 1 to 5% salt per ton of sediment. Therefore, a decrease in one ton of sediment could reduce the salt load in the range of 20 to 100 pounds. Since a change in sediment yield cannot be determined, the change in salinity cannot be predicted.

Salinity levels would increase within the Bush Rim and White Acorn Allotments during the short term because of an anticipated increase in sediment yield. However, salinity levels would decrease below existing levels during the long term due to a decrease in sediment yield.

Salinity levels would increase around the proposed water developments, due to a projected increase in sediment yield. This effect would last for the life of the individual project. Salinity would increase below the proposed reservoirs due to headcutting.

Salinity levels on custodial pastures would not change as sediment yield or runoff would not be expected to change. Salinity would decrease in the Palmer Draw area proportionally to the reduction in sediment yield.

Fecal coliforms (indicators of bacteriological contamination) from livestock grazing would be reduced below existing levels in the Sandy area as livestock are distributed throughout a pasture. Kunkle (1970) found "that only the area immediately adjacent to the stream, rather than the entire watershed, is of major importance in terms of introducing this sort of pollution into the stream" There would be no fecal coliform pollution of streams from livestock in pastures receiving Treatment C (rest season long) under the rest-rotation and alternately grazed systems during the time treatment would be applied. Fecal coliforms from livestock grazing in the Sandy area would increase in streams in pastures receiving Treatments A, B, D, and E during the time livestock would be in the pastures because of increased grazing intensity along streams. The exceptions to this would be the Bar X and Reservoir Allotments, where long-term intensity would decrease under the proposed systems (TABLE 3-13).

Grazing intensity is functionally related to sources of fecal coliform (feces). A change in fecal coliform levels resulting from the proposed livestock grazing on NRL may or may not increase the concentration of fecal coliforms in perennial streams as it is unknown what portion is contributed by livestock in comparison to other sources such as wildlife, man, and livestock grazing on private and State lands. Information is not available to estimate the effects of livestock grazing on NRL on the existing concentration of fecal coliform.

TABLE 3-11

MAXIMUM PERMISSIBLE VELOCITIES FOR SPILLWAY MATERIALS UNDER THE PROPOSED ACTION

Spillway Material	Slope	Maximum Velocity (ft/sec)	Maximum Values for a 12' Wide Spillway 1/ Height	CFS 3/
Fine sand or sandy loam n= .022 2/	1%	2.5 2/	2.8	7.0
	2%	2.5	1.6	4.0
	3%	2.5	1.2	3.0
Ordinary firm loam n= .022	1%	3.5	4.7	16.5
	2%	3.5	2.7	9.5
	3%	3.5	2.0	7.0
Fine gravel n=.02	1%	5.0	7.2	36.0
	2%	5.0	4.2	21.0
	3%	5.0	3.0	15.0
Coarse gravel n=.025	1%	6.0	14.6	87.6
	2%	6.0	8.0	48.0
	3%	6.0	5.7	34.2

1/ Table developed from Manning's Equation (see APPENDIX 3A).

2/ Hydraulic Design Practice, Wyoming Highway Department, 1966.

3/ Cubic feet per second.

FIGURE 3-2 Basin Cut Moving Upstream.

TABLE 3-12

PROJECTED CHANNEL STABILITY
RATING UNDER THE PROPOSED ACTION*

Allotment	Stream Miles	Present	Potential**	23 Years Future
Bar X	9.00	99.0	79.0	93.5
Fish Creek	5.50	92.4	83.5	89.9
Gold Creek	39.00	95.6	90.2	96.1
Little Sandy-Little Prospect	42.25	103.3	91.5	98.9
Steamboat Mountain	9.50	110.0	89.0	89.0
Little Colorado				
Green River Use Area	30.00	85.9	77.7	85.2
Big Sandy Use Area	30.25	102.2	94.6	99.9
Continental Peak	6.25	99.0	79.0	100.0
Pacific Creek	48.00	106.9	92.2	107.7
White Acorn	22.75	95.9	81.1	95.4
Prospect Mountain	24.75	103.1	98.2	103.2
Poston	3.00	104.0	104.0	104.0
Pine Creek	10.50	97.2	92.4	97.7
Mean		100	90	99

TOTAL MILES 280.75

*Channel stability rating is an indicator of the relative channel stability of a stream:

Rating	Channel Condition
Less than 38	Excellent
39-76	Good
77-95	High Fair
96-114	Low Fair
115 and above	Poor

**Potential channel stability rating would be the best rating possible under ideal conditions for livestock grazing.

TABLE 3-13

RELATIVE GRAZING INTENSITY 100 YARDS FROM WATER UNDER THE PROPOSED ACTION

Allotment	Existing	Short Term	Long Term	Seasonal*
Bar X	92	72	79	72
Fish Creek	65	66	71	80
Gold Creek	44	39	55	66
Little Sandy-Little Prospect	59	47	65	65
Steamboat Mountain	7	4	9	4
Little Colorado:				
Green River Use Area	60	78	88	88
Farson Use Area	60	66	78	79
Big Sandy Use Area	60	59	71	73
Red Desert	3	77	81	83
Bush Rim	1	34	44	51
Continental Peak	35	50	52	66
Pacific Creek	10	26	34	43
Sands	15	9	20	21
White Acorn	45	55	57	74
Prospect Mountain	42	36	44	57
Reservoir	67	85	53	65
Poston	49	50	53	65
Pine Creek	35	36	47	53
Mean	38	53	62	66
Percent Change		+39%	+63%	+74%

Note: A relative intensity of 1 is the lowest intensity of the Sandy area, and a relative intensity of 100 is the highest (APPENDIX 2D).

* The maximum intensity of livestock use under the various systems for one year.

Fecal coliform levels from livestock grazing on custodial pastures is not expected to change as grazing intensity is not projected to change under the proposed action. There would be no fecal coliform pollution of streams by livestock in the Palmer Draw area as livestock use would be eliminated.

Summary of Impacts

Water consumption by livestock from reservoirs would increase 109% above the existing use levels in the long term (TABLE 3-6). Evaporation losses from livestock reservoirs would increase 48% above the existing levels of 876 acre-feet (Chapter 2 and TABLE 3-7) to a total of 1,294 acre-feet (418 acre-feet increase). The additional water consumption would have little, if any, effect on other resources.

Storm runoff from a ten-year storm would decrease 29% below existing levels (TABLE 3-8); however, perennial streamflow would not be significantly affected. Sediment yield in arid channels would decrease proportionally to the decrease in runoff (TABLE 3-8). Sediment yield in perennial streams would be unchanged by the proposed action.

Bank erosion along streams would decrease because of a decrease in the channel stability ratings (TABLE 3-12). Decreased bank erosion would reduce sediment yield. This would improve water quality, soil stability, aquatic habitat, and recreation use.

Dissolved solids (salinity levels) in intermittent streams would decrease proportionally to the decrease in runoff. A reduction of dissolved solids would improve water quality. The decrease in sediment yield in arid channels would also result in a reduction of total suspended solids, thus improving water quality. No quantification of these improvements is possible.

Fecal coliforms from livestock grazing would be reduced below existing levels in the Sandy area because of the rest provided in the rest-rotation and alternately grazed systems.

VEGETATION

The short-term and long-term impacts on the vegetation caused by the grazing treatments, grazing systems, and range improvements proposed for the Sandy area are discussed and summarized in this section. Because studies do not exist in the Sandy area, changes in vegetation production, condition, trend, cover, and composition cannot be exactly predicted. Estimates of impacts on vegetation stated in this ES are based on professional judgment and cited studies. These studies, although not conducted within the Sandy area, are believed applicable since the findings discuss the results of efforts to meet basic plant needs. Providing for plant needs for reproduction and establishment should result in similar plant response regardless of location. Appropriate studies to determine the vegetation changes resulting from the grazing systems are included as part of the proposed action (Chapter 1) and would be started before implementation of each AMP. MAPS 2-22 through 2-25 located at the end of Chapter 2 show the locations of the various vegetation types in the Sandy area.

Impact of Grazing Systems

Three-Pasture Rest-Rotation System

Treatments A (or E), B, and C make up the use pattern for this particular system, which would involve (1,811,697 acres) twelve of the sixteen allotments (see Chapter 1) and all vegetation types grazed by cattle, sheep, wild horses, and the four major wildlife species. A three-year cycle is involved that includes concentrated livestock use during the critical growing season on one pasture per year. Relief is then provided in the form of movement of all livestock for the five allotments (655,345 acres) where Treatment E is applied. Some relief is also provided in the allowances made for drift of livestock for the seven allotments (1,156,352 acres) where Treatment A is applied. Movement occurs into a rested pasture at seedripe time of the key forage species (Treatment B). One pasture within the equally divided allotment is allowed to rest from livestock grazing the full grazing season (Treatment C).

The date of movement of livestock from pasture to pasture is the major consideration for determination of impacts on all species within a given vegetation type. The movement is based on the phenological development of the key forage species (TABLE 1-10) identified in the AMP for each allotment. Obtaining the predicted vegetative response is also dependent upon livestock use being managed within the numbers and times proposed for each pasture/treatment. Grazing in excess of permitted AUMs, greater than planned drift between allotments or pastures, and other forms of unauthorized and/or unplanned use can materially alter plant and related responses from those expected. If actual use levels and season of use were not maintained as designed in the proposed action it would be difficult, if not impossible, to evaluate the effectiveness of grazing systems.

The first year an allotment is put on a rest-rotation system, the increased use in the first pasture to be used that spring without previous rest being provided could result in a short-term depletion of the vegetation in that pasture, thus reducing the available forage for wildlife (see wildlife section). Treatments A and E would have the greatest impact on the bunchgrass species in the short term because defoliation during the growing season would cause a depletion of plant food reserves (carbohydrates). Cook (1971) in studies conducted in western Utah found food reserves are at their lowest following defoliation during rapid growth periods (about May 1). Depleted reserves cause slow growth the following spring and reduced production if defoliation again occurs prior to full plant growth and complete restoration of food reserves. He also found that continuous defoliation in excess of 75% was detrimental for the species studied (sagebrush, saltgrass, squirreltail, and Indian ricegrass).

The meadow vegetation type is found in every allotment except the Red Desert, and it is therefore subject to all five grazing systems. Even with its small acreage compared to the total Sandy area, it is extremely significant to the overall vegetation production and grazing use for each allotment. It has been estimated that 90% of the cattle grazing use presently occurs on this vegetation type in the Sandy area. Under the proposed action, this would decrease to between 60% and 70%. All grazing animals are known to utilize this type to some degree depending on the location of the meadow. Treatments A, B, and C of the three-pasture rest-rotation system and A and C of the two-pasture alternately grazed system should have the greatest impact on the largest acreage of meadow type. Treatment A would result in high livestock use season long in the meadows, especially riparian areas, with the result being 70 to 90% utilization of this vegetation type. Treatment B would result in complete rest of the vegetation, including meadows, from livestock grazing during the major portion of the grazing season (until seedripe). Grazing after the rest would then result in approximately the same level of use as in Treatment A. Riparian and meadow areas are among the first areas grazed when cattle are released into a pasture. Treatment C would result in total rest of the meadows from livestock grazing for the year resulting in all vegetation production being available for other uses and for plant development.

Because of the rest provided the meadow and riparian types under the proposed grazing systems over the long term (two years of growing season rest from livestock grazing out of every three), it is anticipated that plant vigor would improve and vegetal cover would increase 2%, resulting in a 10 to 40% increase in vegetation production on the meadow types.

The sagebrush-grass vegetation type is found in all allotments and comprises 77% (1,510,453 acres) of the Sandy area. Consequently, changes due to livestock grazing on such a large area are difficult to predict or measure. However, some generalities can be made based on experience and professional judgment. Utilization (defoliation) of the sagebrush-grass type is expected to average about 65% for key grass species under treatments A and E. Eckert (1973 to 1976) in an unpublished study of northern Nevada grazing found that rest-rotation grazing pastures being used under Treatment A received a three-year average utilization on the key species (bluebunch wheatgrass and Idaho fescue) of 70% (it ranged from 18% to 90%). The livestock use (AUMs) in the two allotments studied was allowed to be 30% above the proper grazing capacity (see Glossary). The livestock use in the Sandy area rest-rotation systems would be 8% (TABLE 2-24) below the surveyed grazing capacity (see APPENDIX 2I for grazing capacity methodology); therefore, it is assumed in the Sandy area the average use would not exceed, and should be below, what Eckert found in Nevada.

In the Farson and Big Sandy Use Areas of the Little Colorado Allotment, big sagebrush is the forage species on which pasture movement would be keyed. The primary reasons for this situation would be the large amount of sheep use and the high antelope concentration in this area. Because of predominant sheep use and the long grazing season, utilization on sagebrush in pastures under Treatment A would be as high as 15 to 20%.

Treatment A could cause the major impact relative to trampling since the livestock would be allowed to continue use of the area even after seedripe when the Treatment B pasture would be opened for grazing. However, the allowance for drift into the Treatment B pasture from the graze-early pasture, and operator management practices should minimize this trampling damage since a fresh supply of forage would be made available and very few animals would remain in the Treatment A pasture. A large percentage of wildlife and wild horses would be expected to utilize the rested pasture.

Based on the implementation schedule for the allotment management plans (TABLE 1-6) and the range improvement construction schedule (TABLE 1-14), the grazing systems would be implemented over an eight-year period. Water developments would be constructed first. The additional waters would improve livestock and wildlife distribution in the interim by making water available to the animals in new areas. Cross fences would be constructed over a period of time, allowing the opportunity to develop intermediate grazing systems of deferred grazing which would improve the vigor of the forage species. This situation would reduce the short-term impacts (defoliation during the growing season) of the areas scheduled for Treatment A or E during the first year.

Treatment B, rest until seedripe then graze, would allow the bunchgrass and rhizomatous grasses a chance to fully produce seed, shoots, roots, and food reserves before grazing. Grazing after the food storage cycle has been completed and seed has ripened has the least detrimental effect (Stoddart, Smith and Box 1975) and produces the maximum forage (Vogel and Bjugstad 1968) for grasses. Furthermore, Payne (1958) found that on *Agropyron spicatum* (bluebunch wheatgrass) *and Stipa comata* (needle-and-thread grass), ". . .autumn removal regardless of severity does not markedly affect production of individual plants in the following years"

Providing rest from livestock grazing until seedripe enables the various species to propagate themselves, increase their percent composition, and in some cases increase the percent vegetal cover. All vegetation species rested until seedripe on all range sites would tend to fill in the open spaces and produce shoot, root, and food reserves under this treatment.

Following the rest period, the livestock would be allowed to enter the pasture receiving Treatment B in order to shatter the mature seed and trample it for future seedling growth. This trampling period would allow a portion of the new growth and remaining old growth to be mixed into the soil (litter), thereby improving the quality of the soil and adding to the ground cover which would provide for increased soil protection. This grazing period would allow high livestock production as well as benefit the range resource.

Eckert showed average use of key species under Treatment B was 79% (ranging from 54% to 90%). However, because of the reduced livestock use in the

Sandy area in comparison to Eckert's study, it is estimated that utilization would not exceed 70% of the key species of these pastures.

The vigor (plant health) of the forage plants for which the AMPs are designed would be improved most from Treatment C, rest year long. The pasture receiving Treatment C under a rest-rotation system would be preceded the year before (except for the first year) by Treatment B. Therefore, the plants would have good food reserves for shoot and root growth during Treatment C. Provided adequate carbon dioxide, leaf surface, light, water, temperature, and soil nutrients are available (Stoddart, Smith, and Box 1975), grass plants rested under Treatment C would produce adequate root reserves for the following year's growth. They would also produce additional reserves and root growth that would improve the vigor of the individual plants. According to Hazell (1967), increased vigor is a prime factor related to increased production.

Utilization in this pasture would range from less than 10% to over 30%, depending on the amount of wildlife and wild horse use in any given area of the pasture. Eckert showed 10% to 70% utilization of key species in the rested pastures; however, the two allotments studied experienced some trespass livestock use in the rested pasture during the life of the study.

The rest under Treatment C could allow seedlings to grow for one complete growing season before they would be subjected to livestock grazing. This would increase their chance of survival.

The treatments just discussed (A, E, B, and C) make up the three-pasture rest-rotation grazing system. An explanation of how these treatments are applied to the three pastures of a given allotment is given in Chapter 1. It is important to remember that each pasture is used by livestock according to only one treatment per year, and the year to year use is rotated as follows: Treatment A (graze season long) is always followed the next year by Treatment B (rest until seedripe of key species then graze), which is always followed the next year by Treatment C (complete rest), which is always followed the next year by Treatment A (graze season long), and so on.

Plant composition under the rest-rotation system would not be expected to show a dramatic change except in those areas in poor condition because of overgrazing in the past. Many of these areas such as the sagebrush-grass types in the Green River Use Area of the Little Colorado Allotment and meadow types throughout the Sandy area show an overabundance of invader shrub and forb growth where concentrated cattle grazing has occurred. The rest periods afforded these areas through the grazing treatments designed for the three-pasture rest-rotation system should allow the key species and native meadow grasses an opportunity to compete successfully and begin to replace the invader species in the long term. The success of plant composition change is site specific and would be dependent on the grazing intensity allowed by the various AMPs developed (TABLES 3-4 and 3-5).

Two types of ground cover, litter and live vegetation, would be impacted by the proposed action. Litter is a layer of dead plant material on the soil's surface which helps add organic material to the soil and provides protection from wind and water. Litter would increase under Treatment B because of full plant growth before grazing. Livestock would break off a large amount of plant growth after grazing starts in this pasture. Litter accumulation under Treatment A would increase after the first year because the previous year that pasture was rested year long (Treatment C), and some of the old plant growth would become litter the following spring. Over the long term, litter accumulation will level off in all pastures at an approximate average of 10% to 20% more than the existing level (TABLE 3-14). Eckert found an average increase of 8% in litter for the three year period after implementation of the grazing systems.

There should be no significant change in the live vegetal cover in the short term, but in the long term increased vegetal cover would occur in the rest-rotation pastures. Gibbens and Fisser (1975) found that in the bunchgrass types of Wyoming there was a steady increase in cover of perennial grasses under all grazing systems (including rest-rotation). Rhizomatous forms of wheatgrass made the greatest gain in cover. As plant vigor increases, the basal area of grasses and canopy cover of shrubs would increase, which would increase vegetal cover. This increase would range from 1% to 5% depending on the allotment. Existing and projected average percent ground cover and vegetal cover under the proposed action is shown in TABLE 3-14. Eckert found in the five pastures studied increase in cover ranged from 0.8% to 4.6% under rest-rotation.

Two-Pasture Alternately Grazed System

This grazing system incorporates Treatments A and C (see detailed treatment discussion under three-pasture rest-rotation) into its grazing formula. It would involve the Fish Creek (7,237 acres, TABLE 1-4) and the two high elevation pastures of the Little Sandy-Little Prospect (29,628 acres); White Acorn (17,852 acres); and the Prospect Mountain Allotments (23,361 acres).

This grazing system does not key on any forage plant for pasture movement since one-half of the area would be scheduled for season-long grazing (Treatment A), and the other half would receive a full season of rest (Treatment C). Treatments would be alternated annually.

Both classes of livestock are scheduled to graze all these areas except the Fish Creek Allotment, which would have strictly cattle grazing. No wild horses are planned for these areas. All four major wildlife species would be expected to utilize the range in these pastures except the Fish Creek Allotment, which is considered to be a marginal elk use area.

The key species found in the four vegetation types (sagebrush-grass, meadow, mountain shrub, and conifer) affected by this system would not be expected to show much improvement after the first or second grazing cycles. Plant vigor in the pasture subjected to Treatment A the first year would be expected to be reduced be-

TABLE 3-14

ESTIMATED FUTURE VEGETAL PRODUCTION AND COVER UNDER THE PROPOSED ACTION COMPARED WITH PRESENT AND POTENTIAL PRODUCTION AND PRESENT COVER BY ALLOTMENT AND VEGETATION TYPE

Grazing System	No.	Allotments and Vegetation Types	Present Production Pounds Dry Weight Forage (AUMs)	Maximum Potential Production Pounds (AUMs)	Present Ground Cover %	Present Vegetal Cover %	Projected Production Pounds (AUMs)	Projected Average Ground Cover %	Projected Vegetal Cover %
Rest -	6.	Little Colorado							
Rotation	a.	Green River Use Area	13,144,560	145,718,850			21,060,780		
3-Pasture			(16,852)	(49,796)			(27,001)		
		Sagebrush - Grass			25	17		30	17
		Saltbush - Winterfat			23	15		25	15
		Grass			27	23		30	23
		Meadow			34	32		41	35
		Greasewood			28	11		29	11
		Conifer			27	12		30	12
	b.	Farson Use Area	10,141,560	80,729,887			14,420,640		
			(13,002)	(36,173)			(18,488)		
		Sagebrush - Grass			25	17		30	17
		Saltbush - Winterfat			23	15		25	15
		Greasewood			28	11		29	11
		Grass			27	23		30	23
	c.	Big Sandy Use Area	8,191,560	98,743,840			13,057,200		
			(10,502)	(36,965)			(16,740)		
		Sagebrush - Grass			25	17		30	17
		Saltbush - Winterfat			23	15		25	15
		Greasewood			28	11		29	11
		Meadow			34	32		41	35
	7.	Red Desert	14,079,000	115,032,620			16,329,300		
			(18,050)	(43,918)			(20,935)		
		Sagebrush - Grass			27	14		32	14
		Saltbush - Winterfat			27	09		30	09
		Grass			18	15		20	15
		Greasewood			22	06		23	06
		Perennial Forb			16	09		17	09
	8.	Bush Rim	5,032,560	79,355,754			5,534,100		
			(6,452)	(26,950)			(7,095)		
		Sagebrush - Grass			28	13		34	13
		Saltbush - Winterfat			42	11		46	11
		Grass			18	15		20	15
		Meadow			97	18		97	22
		Greasewood			14	16		15	16
		Mountain Shrub			64	19		64	19
		Perennial Forb			16	12		17	12
		Conifer			78	09		86	09
	9.	Continental Peak	4,878,120	75,440,160			5,658,120		
			(6,254)	(27,288)			(7,254)		
		Sagebrush - Grass			47	16		56	16
		Saltbush - Winterfat			16	07		18	07
		Grass			18	14		20	14
		Meadow			97	19		97	27
		Greasewood			74	11		78	11
		Mountain Shrub			94	19		94	19
		Perennial Forb			22	14		23	14
	10.	Pacific Creek	8,693,880	178,340,170			13,433,940		
			(11,146)	(61,413)			(17,223)		
		Sagebrush - Grass			40	14		48	14
		Saltbush - Winterfat			68	06		75	06
		Grass			47	12		52	12
		Meadow			82	17		94	24
		Greasewood			22	21		23	21
		Mountain Shrub			94	16		94	18
		Perennial Forb			11	12		12	12
		Conifer			76	11		84	11
	11.	Sands	4,279,860	49,653,555			4,906,980		
			(5,487)	(15,763)			(6,291)		
		Sagebrush - Grass			29	15		35	15
		Grass			32	16		37	18
		Meadow			65	23		78	26
		Greasewood			14	12		15	12
		Perennial Forb			11	12		12	12
		Conifer			74	08		81	08
	14.	Reservoir	1,341,600	17,431,838			2,191,800		
			(1,720)	(8,015)			(2,810)		
		Sagebrush - Grass			32	12		38	12
		Meadow			49	28		59	30

TABLE 3-14 (Cont'd)

ESTIMATED FUTURE VEGETAL PRODUCTION AND COVER UNDER THE PROPOSED ACTION COMPARED WITH PRESENT AND POTENTIAL PRODUCTION AND PRESENT COVER BY ALLOTMENT AND VEGETATION TYPE

Grazing System	No.	Allotments and Vegetation Types	Present Production Pounds Dry Weight Forage (AUMs)	Maximum Potential Production Pounds (AUMs)	Present Ground Cover %	Present Vegetal Cover %	Projected Production Pounds (AUMs)	Projected Average Ground Cover %	Projected Vegetal Cover %
Rest-Rotation 3-Pasture (cont'd)	15.	Poston	2,693,340 (3,453)	106,072,216 (8,065)			3,761,160 (4,822)		
		Sagebrush - Grass			28	13		34	13
		Meadow			51	30		61	32
	16.	Pine Creek	943,020 (1,209)	17,429,095 (5,993)			1,537,380 (1,971)		
		Sagebrush - Grass			56	15		62	15
		Meadow			60	26		69	28
		Subtotal	73,419,060 (94,127)	963,947,985 (320,339)			101,891,400 (133,630)		
Alternately Grazed 2-Pasture	2.	Fish Creek	744,120 (954)	10,803,090 (3,730)			1,105,260 (1,417)		
		Sagebrush - Grass			40	15		46	15
		Meadow			91	26		91	26
		Subtotal	744,120 (954)	10,803,090 (3,730)			1,105,260 (1,417)		
Combination Alternately Grazed 2-Pasture and Rest Rotation 3-Pasture	4.	Little Sandy - Little Prospect	11,810,760 (15,142)	165,269,672 (50,666)			14,699,880 (18,846)		
		Sagebrush - Grass			39	15		46	15
		Meadow			86	30		90	32
		Mountain Shrub			77	12		85	12
	12.	White Acorn	4,195,620 (5,379)	74,676,564 (20,148)			5,531,760 (7,092)		
		Sagebrush - Grass			54	16		63	16
		Meadow			77	29		90	33
		Mountain Shrub			53	14		58	20
		Conifer			78	11		78	11
	13.	Prospect Mountain	4,134,000 (5,300)	89,018,568 (24,016)			6,509,880 (8,346)		
		Sagebrush - Grass			36	15		42	15
		Meadow			56	30		66	32
		Mountain Shrub			77	16		85	18
		Conifer			93	03		93	03
		Subtotal	20,140,380 (25,821)	328,964,804 (94,830)			26,741,520 (34,284)		
Alternately Grazed 4-Pasture	3.	Gold Creek	3,205,800 (4,110)	81,759,637 (20,606)			4,164,420 (5,339)		
		Sagebrush - Grass			33	17		40	17
		Meadow			73	25		73	25
		Mountain Shrub			79	18		95	20
		Conifer			78	09		78	09
		Subtotal	3,205,800 (4,110)	81,759,637 (20,506)			4,164,420 (5,339)		
Deferred 2-Pasture	5.	Steamboat Mountain	1,635,660 (2,097)	38,631,491 (12,421)			1,960,140 (2,513)		
		Sagebrush - Grass			49	11		61	11
		Meadow			60	22		60	22
		Greasewood			56	12		56	12
		Mountain Shrub			79	18		83	15
		Perennial Forb			16	06		16	06
		Subtotal	1,635,660 (2,097)	38,631,491 (12,421)			1,960,140 (2,513)		
Deferred 3-Pasture	1.	Bar X	638,820 (819)	8,367,980 (2,755			847,080 (1,086)		
		Sagebrush - Grass			48	17		60	17
		Meadow			94	30		94	32
		Subtotal	638,820 (819	8,367,980 (2,755)			847,080 (1,086)		
		TOTALS	99,783,840 (127,928)	1,432,474,987 (454,681)			136,709,820 (175,269)		

cause of season-long grazing but would be improved to present vigor or better following the second year when complete rest would be provided. Over the long term, utilization of the meadow type under Treatment A could reach as much as 90%.

Plant composition would not be expected to change dramatically from implementation of this grazing system. First impressions could indicate a slight trend toward increased shrub density; however, the full season of rest afforded the pasture every other year should tend to stabilize the composition of both the grass and shrub species.

Ground cover should remain constant over the short-term and long-term periods as shown by allotment in TABLE 3-14 with an approximate 10 to 57% increase from the present. A similar situation would be expected for the vegetal cover.

Four-Pasture Alternately Grazed System

Treatments E, B, and C (see detailed discussion under three-pasture rest-rotation) would be utilized in the grazing formula for this system. This system was designed for application to the Gold Creek Allotment (30,525 acres), where the sagebrush-grass type would be dominant with considerable significance because of its availability.

Bluebunch wheatgrass would be the key forage plant (TABLE 1-10) used for pasture movement in this allotment. This system is similar to the two-pasture alternately grazed in that one-half of the allotment would be grazed each year (Treatments E and B), and the other half would receive a full season of rest (Treatment C). However, unlike the two-pasture alternately grazed system, two pastures would be utilized each year with movement from one to the other based on the seedripe date of the key forage plant.

The four major wildlife species would graze this allotment in common with the licensed (see Glossary) cattle use. No wild horses are planned for this allotment.

Because of heavy spring grazing followed by complete rest, plant composition would not be expected to change in the lower elevation pastures used in the spring. Little or no seedling establishment would be expected in these pastures, and the rest provided should slightly increase plant vigor in the long term.

In the two summer use pastures (four and five), livestock grazing would take place on only one pasture each year and only after seedripe of the key forage species. This rest before grazing would allow for maximum plant development (root and shoot production and food reserves) and seed production to occur (see rest-rotation discussion, Treatment B). The grazing of livestock after seedripe would serve to plant the mature seeds. This is followed by two full growing seasons of rest, which would allow for maximum improvement in vigor of existing plants and some reestablishment of key forage species. Ground cover should increase an average of 8% for the entire Gold Creek Allotment (TABLE 3-14), with the most significant improvement being in the two higher elevation pastures.

Two-Pasture Deferred System

This system incorporates Treatments E and B into its grazing formula and would involve the Steamboat Mountain Allotment (40,537 acres), where the sagebrush-grass vegetation type encompasses the largest acreage (30,711 acres). This is compared to 1,000 to 5,000 acres for each of the other major types in the allotment (TABLE 2-14): meadow, greasewood, mountain shrub, and perennial forb.

Thickspike wheatgrass would be the key forage species on which the seedripe date is based. This would occur around August 10 (TABLE 1-10). The seedripe date relative to this particular species would not be too important since this species is a rhizomatous plant reproducing most successfully vegetatively. However, the seedripe date would allow other important grasses present on the allotment to produce seed and gain vigor necessary for continued propagation.

Treatment B, rest until seedripe and then graze, allows any seed produced a chance to be planted by trampling. However, the system does not provide rest for seedling establishment the following year.

The grazing animals present on this allotment which would have the major impact on the vegetation include cattle, sheep, pronghorn antelope, deer, and elk. Wild horses currently utilize forage within this allotment, but they are scheduled to be removed prior to full implementation of the AMP.

Effects of the grazing system on the vegetation would not be expected to be very noticeable through the first two grazing cycles. By the end of the short term, an improvement over the start of the system should be noted as vigor of the range plants within the sagebrush-grass type would be enhanced from the early growing season relief afforded through Treatment B.

The complete removal of livestock from the Treatment E pasture would reduce livestock utilization of shrub species in that pasture. Key forage species utilization in any one pasture should not exceed 45% because the entire allotment would be used each year.

Plant composition and vegetal cover would not be expected to improve to any great extent, primarily because of the high percentage of shrub cover found in the sagebrush-grass type, which responds very slowly to the grazing system. Ground cover would be expected to improve by an average of 5% (TABLE 3-14), however, with the increased litter production that would be probable from improved vigor of the plants.

Considerable cover is afforded the high concentration of elk on this allotment because of the unusually high sagebrush growth found in the west pasture. A limited understory of grasses and forbs is found here, and it would be improved over the proposed deferred system. Elk seem to congregate here a good share of the year, which has a limiting effect on the growth of the more desirable forage species. Livestock would not be expected to utilize this particular area much more than at present because of the steepness of the terrain.

Three-Pasture Deferred Grazing System

The three-pasture deferred system utilizes the E, B, and D treatments in its grazing sequence over a six-year period and would be developed for the Bar X Allotment (6,895 acres). Only the sagebrush-grass and meadow types would be impacted by this system. The former is the dominant type covering approximately 68% of the allotment (TABLE 2-14).

Treatments E and B were discussed in detail under rest-rotation. Treatment D provides rest from livestock grazing until peak of flowering stage (full bloom) of the key forage species. This rest allows seedlings to get better established before grazing and allows rest long enough for root, shoot, food reserves, and forage production by the grass plants to improve vigor to a point where grazing can occur without damage to the plant.

The key forage species on which pasture movements are based (TABLE 1-10) would be bluebunch wheatgrass for the Bar X Allotment. The peak of flowering date is July 25, and the seedripe date is August 15. Treatment D is based on the peak of flowering date (rest until peak of flowering, then graze).

Cattle use (792 AUMs of the 879 AUMs for the Bar X Allotment) would be the major grazing use, although 70 AUMs of sheep use and 17 AUMs of horse use would be utilized. The allotment would also be considered habitat for pronghorn antelope, deer, and moose. No wild horses would inhabit the area, and elk habitat would be marginal.

The impacts from this grazing system would be basically the same as those discussed for the two-pasture deferred system. Instead of just the two pastures, however, Treatment D would be utilized in a third pasture.

The prime benefit realized from this system would be the alternation of grazing through three pastures during one grazing season. This would minimize the impacts of livestock concentrations over an entire season that are common with the present season-long grazing, thus allowing the vegetation a chance to reproduce and increase its vigor.

Ground cover could improve in the long term because the vegetation would be expected to increase in vigor which would produce an increased quantity of litter. An increase from 48% to 60% in ground cover would be expected (TABLE 3-14). Vegetal cover should not vary to any noticeable degree as invaders are not a problem in this allotment, and adequate rest for maintenance is provided.

The willows, generally considered a major element in the riparian zone of the wet meadow types, would not be expected to respond as successfully to any of the grazing systems as the grass species found on the same site. In most situations in the Sandy area, the willow growth is either very young or very old showing signs of continuous browsing.

The rest afforded the various pastures through Treatments B and C should allow the existing willows, as well as the grass vegetation, ample opportunity to better resist the effects of grazing. Reduced grazing pressure by the livestock on these species should be realized from the improved livestock distribution resulting from increased water availability as proposed in Chapter 1 (TABLE 1-13).

Willows reproduce vegetatively and would respond to rest from grazing by producing shoots from parent plants. These shoots would grow between 6 inches and 3 feet in one growing season under Treatment B or C. Since they are very desirable forage, these shoots will usually be completely grazed off as soon as livestock use the pastures (Treatment A or B). In northern Nevada, BLM studies (1967-77) showed no willow reproduction after three grazing cycles of a three-pasture rest-rotation system in an allotment where a perennial stream flowed through one of the three pastures. Because the grazing intensity would be lighter and water distribution better in Sandy than in the northern Nevada allotment, it is anticipated that willow composition in most meadows would increase from the present 3% to 5% in the long term.

Forage Production

The anticipated improvements in plant vigor, composition, and cover previously discussed under each grazing system were used in a soil-vegetation production analysis by range site within each pasture of each allotment. The pasture level data are available upon request from the Rock Springs District Office and are summarized by allotment in TABLES 3-15 and 3-16. Livestock forage production would be expected to increase by 47,333 cattle AUMs from 125,500 AUMs (TABLE 2-24) to 172,833 AUMs (TABLE 3-15) and 53,188 sheep AUMs from 142,861 AUMs to 196,049 AUMs in the 23-year, long-term period (TABLE 3-17). Increases in forage production by vegetation types would range from a low of 2% in the greasewood type to 100% in the meadow type. APPENDIX 2I shows the methodologies and procedures used in determining forage production.

According to the soil-vegetation production analysis methodology used to develop the production data (an example is found in APPENDIX 2I and the summary found in TABLE 3-15) for the Gold Creek Allotment, an approximate overall increase in production of 10% or 620 AUMs would be expected in the long term over that currently being produced. This increase is 301 AUMs less than the desired long-term use as identified in the AMP. The prime cause for this is probably the limiting factor of heavy use each year on half the total allotment. The major consideration here is that of production on the sagebrush-grass type. Since this is the predominant type in the Sandy area, except for the Red Desert Allotment where the saltbush-winterfat type is dominant, the sagebrush-grass type would be the major contributor to the overall increase in production as a result of the grazing system.

Production of each type under Treatment A would not be expected to improve during the first year of implementation. Livestock distribution should be good in those pastures because of the increased number of water developments resulting in a more uniform utilization of available forage species. The trampling effect of increased livestock numbers on a smaller geographic area

TABLE 3-15

PROJECTED LONG-TERM VEGETATION PRODUCTION, USE WITH THE PROPOSED ACTION, AND PROJECTED LONG-TERM AVAILABLE USE IN POUNDS OF DRY WEIGHT FORAGE AND IN AUMS (NRL, PRIVATE, AND STATE) BY SPECIES FOR EACH ALLOTMENT

	Cattle			Sheep			Wild Horses		
Allotment	Production[1/] Pounds Dry Weight Forage (AUMs)	Use Pounds[2/] Dry Weight Forage/Proposed Action (AUMs)	Available[3/] Use Pounds Dry Weight Forage (AUMs)	Production[1/] Pounds Dry Weight Forage (AUMs)	Use Pounds[2/] Dry Weight Forage/Proposed Action (AUMs)	Available[3/] Use Pounds Dry Weight Forage (AUMs)	Production[1/] Pounds Dry Weight Forage (AUMs)	Use Pounds[2/] Dry Weight Forage/Proposed Action (AUMs)	Available[3/] Use Pounds Dry Weight Forage (AUMs)
1. Bar X	847,080 (1,086)	631,020 (809)	748,800 (960)	933,750 (1,245)	52,500 (70)	63,000 (84)	0 (0)	0 (0)	0 (0)
2. Fish Creek	1,015,560 (1,302)	692,640 (888)	809,640 (1,038)	1,027,500 (1,370)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
3. Gold Creek	4,047,420 (5,189)	2,746,380 (3,521)	4,282,200 (5,490)	3,115,500 (4,154)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
4. Little Sandy-Little Prospect	14,231,100 (18,245)	7,260,240 (9,308)	9,695,400 (12,430)	15,503,250 (20,671)	2,478,000 (3,304)	3,202,500 (4,270)	0 (0)	0 (0)	0 (0)
5. Steamboat Mountain	1,811,160 (2,322)	1,255,800 (1,610)	1,731,600 (2,220)	2,405,250 (3,207)	75,000 (100)	75,000 (100)	0 (0)	0 (0)	0 (0)
6. Little Colorado Green River Use Area	21,060,780 (27,001)	10,330,320 (13,244)	15,720,900 (20,155)	22,365,750 (29,821)	3,164,250 (4,219)	4,815,000 (6,420)	22,388,400 (24,876)	907,200 (1,008)	907,200 (1,008)
Farson Use Area	14,420,640 (18,488)	60,060 (77)	160,680 (206)	15,481,500 (20,642)	10,171,500 (13,562)	14,546,250 (19,395)	14,819,400 (16,466)	712,800 (792)	712,800 (792)
Big Sandy Use Area	13,057,200 (16,740)	2,649,660 (3,397)	3,726,060 (4,777)	14,102,250 (18,803)	6,672,000 (8,896)	9,210,000 (12,280)	0 (0)	0 (0)	0 (0)
7. Red Desert	16,329,300 (20,935)	8,971,560 (11,502)	10,572,900 (13,555)	17,439,000 (23,252)	3,917,250 (5,223)	4,608,750 (6,145)	17,681,400 (19,646)	4,749,300 (5,277)	4,749,300 (5,277)
8. Bush Rim	5,534,100 (7,095)	2,549,040 (3,268)	3,120,000 (4,000)	7,293,750 (9,725)	1,914,000 (2,552)	2,325,000 (3,100)	6,385,500 (7,095)	1,206,000 (1,340)	1,206,000 (1,340)
9. Continental Peak	5,658,120 (7,254)	1,361,100 (1,745)	1,513,200 (1,940)	6,844,500 (9,126)	3,606,000 (4,808)	3,960,000 (5,280)	6,528,600 (7,254)	1,064,700 (1,183)	1,064,700 (1,183)
10. Pacific Creek	13,363,740 (17,133)	4,181,580 (5,361)	5,257,200 (6,740)	15,165,000 (20,220)	4,727,250 (6,303)	5,947,500 (7,930)	0 (0)	0 (0)	0 (0)
11. Sands	4,896,840 (6,278)	2,619,240 (3,458)	3,588,000 (4,600)	5,598,000 (7,464)	519,000 (592)	592,500 (790)	0 (0)	0 (0)	0 (0)
12. White Acorn	5,531,760 (7,092)	2,398,500 (3,075)	2,542,800 (3,260)	4,949,250 (6,599)	1,731,750 (2,309)	1,826,250 (2,435)	0 (0)	0 (0)	0 (0)
13. Prospect Mountain	5,889,780 (7,551)	2,274,480 (2,916)	3,666,000 (4,700)	6,139,500 (8,186)	1,326,000 (1,768)	2,317,500 (3,090)	0 (0)	0 (0)	0 (0)
14. Reservoir	2,116,140 (2,713)	171,600 (220)	206,700 (265)	2,137,500 (2,850)	1,603,500 (2,138)	1,935,000 (2,580)	0 (0)	0 (0)	0 (0)
15. Poston	3,502,200 (4,490)	574,860 (737)	670,800 (860)	4,392,750 (5,857)	2,559,000 (3,412)	2,947,500 (3,930)	0 (0)	0 (0)	0 (0)
16. Pine Creek	1,496,820 (1,919)	712,920 (914)	963,300 (1,235)	2,142,750 (2,857)	157,500 (210)	217,500 (290)	0 (0)	0 (0)	0 (0)
TOTALS	134,809,740 (172,833)	51,441,000 (66,050)	68,976,180 (88,431)	147,036,750 (196,049)	44,674,500 (59,466)	58,589,250 (78,119)	67,803,300 (75,337)	8,640,000 (9,600)	8,640,000 (9,600)

TABLE 3-15 (Continued)

PROJECTED LONG-TERM VEGETATION PRODUCTION, USE WITH THE PROPOSED ACTION, AND PROJECTED LONG-TERM AVAILABLE USE IN POUNDS OF DRY WEIGHT FORAGE AND IN AUMS (NRL, PRIVATE, AND STATE) BY SPECIES FOR EACH ALLOTMENT

	Pronghorn			Mule Deer			Elk		
Allotment	Production 1/ Pounds Dry Weight Forage (AUMs)	Use Pounds 2/ Dry Weight Forage/Proposed Action (AUMs)	Available 3/ Use Pounds Dry Weight Forage (AUMs)	Production 1/ Pounds Dry Weight Forage (AUMs)	Use Pounds 2/ Dry Weight Forage/Proposed Action (AUMs)	Available 3/ Use Pounds Dry Weight Forage (AUMs)	Production 1/ Pounds Dry Weight Forage (AUMs)	Use Pounds 2/ Dry Weight Forage/Proposed Action (AUMs)	Available 3/ Use Pounds Dry Weight Forage (AUMs)
1. Bar X	561,782 (697)	20,150 (25)	29,822 (37)	626,430 (1,330)	156,372 (332)	75,360 (160)	0 (0)	10,800 (20)	0 (0)
2. Fish Creek	807,612 (1,002)	12,896 (16)	36,270 (45)	1,047,504 (2,224)	5,652 (12)	75,360 (160)	0 (0)	0 (0)	0 (0)
3. Gold Creek	3,447,262 (4,277)	114,452 (142)	153,946 (191)	3,999,261 (8,491)	243,978 (518)	495,021 (1,051)	6,710,580 (12,427)	224,620 (453)	447,120 (828)
4. Little Sandy-Little Prospect	20,956,806 (26,001)	847,912 (1,052)	792,298 (983)	21,318,402 (45,262)	3,167,946 (6,726)	3,199,974 (6,794)	4,884,300 (9,045)	553,500 (1,025)	2,021,760 (3,744)
5. Steamboat Mountain	1,912,638 (2,373)	91,078 (113)	124,124 (154)	1,964,070 (4,170)	35,018 (758)	72,534 (154)	1,979,640 (3,666)	255,420 (473)	77,760 (144)
6. Little Colorado Green River Use Area	21,514,558 (26,693)	537,602 (667)	932,542 (1,157)	3,894,699 (8,269)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Farson Use Area	14,456,416 (17,936)	755,222 (937)	670,592 (832)	2,632,419 (5,589)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Big Sandy Use Area	14,430,624 (17,904)	1,063,114 (1,319)	811,642 (1,007)	3,365,766 (7,146)	109,743 (233)	168,618 (358)	1,298,700 (2,405)	35,100 (65)	0 (0)
7. Red Desert	14,628,094 (18,149)	763,282 (947)	519,870 (645)	90,432 (192)	38,622 (82)	424,842 (902)	1,723,680 (3,192)	20,520 (38)	99,360 (184)
8. Bush Rim	6,655,142 (8,257)	274,846 (341)	336,102 (417)	4,035,528 (8,568)	465,348 (988)	176,154 (374)	5,637,600 (10,440)	355,860 (659)	172,800 (320)
9. Continental Peak	6,589,050 (8,175)	326,430 (405)	270,010 (335)	5,842,284 (12,404)	177,096 (376)	538,353 (1,143)	304,020 (563)	656,180 (1,217)	108,000 (200)
10. Pacific Creek	17,232,280 (21,380)	1,499,966 (1,861)	761,670 (945)	18,000,678 (38,218)	918,921 (1,951)	313,215 (665)	10,014,840 (18,546)	294,300 (545)	457,920 (848)
11. Sands	7,804,498 (9,683)	550,498 (683)	310,310 (385)	8,835,960 (18,760)	506,796 (1,076)	188,871 (401)	7,853,220 (14,543)	163,620 (303)	228,960 (424)
12. White Acorn	3,245,762 (4,027)	185.380 (230)	188,604 (234)	3,435,945 (7,295)	238,797 (507)	756,426 (1,606)	1,885,140 (3,491)	157,140 (291)	535,680 (992)
13. Prospect Mountain	8,454,134 (10,489)	291,772 (362)	268,398 (333)	9,090,771 (19,301)	1,307,496 (2,776)	755,955 (1,605)	1,868,940 (3,461)	656,640 (1,216)	656,640 (1,216)
14. Reservoir	3,929,250 (4,875)	211,978 (263)	146,692 (182)	3,968,646 (8,426)	113,040 (240)	349,482 (742)	0 (0)	0 (0)	0 (0)
15. Poston	6,493,942 (8,057)	212,784 (264)	146,692 (182)	5,599,248 (11,888)	330,171 (701)	29,202 (62)	0 (0)	0 (0)	0 (0)
16. Pine Creek	925,288 (1,148)	50,778 (63)	42,718 (53)	1,076,706 (2,286)	15,072 (32)	113,511 (241)	262,440 (486)	0 (0)	41,040 (76)
TOTALS	154,045,138 (191,123)	7,810,140 (9,690)	6,542,302 (8,117)	98,824,749 (209,819)	8,152,068 (17,308)	7,732,878 (16,418)	44,423,100 (82,265)	2,843,720 (5,268)	4,847,040 (8,976)

TABLE 3-15 (Continued)

PROJECTED LONG-TERM VEGETATION PRODUCTION, USE WITH THE PROPOSED ACTION, AND PROJECTED LONG-TERM AVAILABLE USE IN POUNDS OF DRY WEIGHT FORAGE AND IN AUMS (NRL, PRIVATE, AND STATE) BY SPECIES FOR EACH ALLOTMENT

Allotment	Moose: Production 1/ Pounds Dry Weight Forage (AUMs)	Moose: Use Pounds 2/ Dry Weight Forage/Proposed Action (AUMs)	Moose: Available 3/ Use Pounds Dry Weight Forage (AUMs)	Total Allotment Use Pounds Dry Weight Forage/Proposed Action (AUMs)	Total Allotment Available Use Pounds Dry Weight Forage (AUMs)
1. Bar X	106,380 (197)	76,680 (142)	0 (0)	947,522 (1,398)	916,982 (1,241)
2. Fish Creek	359,100 (665)	14,580 (27)	19,440 (36)	955,768 (943)	940,710 (1,279)
3. Gold Creek	1,162,080 (2,152)	62,640 (116)	51,840 (96)	3,727,204 (4,750)	5,430,127 (7,656)
4. Little Sandy-Little Prospect	1,817,640 (3,366)	169,560 (336)	226,800 (420)	26,693,398 (21,729)	19,138,732 (28,641)
5. Steamboat Mountain	0 (0)	0 (0)	0 (0)	1,936,816 (3,074)	2,081,018 (2,772)
6. Little Colorado Green River Use Area	51,840 (96)	31,320 (58)	0 (0)	14,970,692 (19,196)	22,375,642 28,740)
Farson Use Area	1,080 (2)	0 (0)	0 (0)	11,699,582 (15,368)	16,090,322 (21,225)
Big Sandy Use Area	0 (0)	0 (0)	0 (0)	10,529,617 (13,910)	13,916,320 (18,442)
7. Red Desert	0 (0)	0 (0)	0 (0)	18,469,505 (23,069)	20,975,022 (26,708)
8. Bush Rim	0 (0)	0 (0)	0 (0)	6,765,094 (9,148)	7,336,056 (9,551)
9. Continental Peak	25,380 (47)	20,520 (38)	9,180 (17)	6,652,236 (8,734)	7,463,443 (10,098)
10. Pacific Creek	178,200 (330)	49,140 (91)	53,460 (99)	12,034,037 (16,784)	12,790,965 (17,227)
11. Sands	50,760 (94)	0 (0)	0 (0)	5,489,834 (6,354)	4,908,641 (6,600)
12. White Acorn	1,084,320 (2,008)	129,060 (239)	51,840 (96)	4,846,807 (6,663)	5,901,600 (8,623)
13. Prospect Mountain	450,900 (835)	173,340 (321)	58,320 (108)	5,530,228 (8,434)	7,722,813 (11,052)
14. Reservoir	61,560 (114)	32,400 (60)	25,920 (48)	2,132,518 (2,921)	2,663,794 (3,817)
15. Poston	59,400 (110)	44,280 (82)	19,440 (36)	3,721,095 (5,196)	3,813,634 (5,070)
16. Pine Creek	320,220 (593)	24,300 (45)	19,440 (36)	960,570 (1,264)	1,397,509 (1,931)
TOTALS	5,728,860 (10,609)	828,360 (1,533)	535,680 (992)	124,330,248 (168,915)	155,863,330 (210,653)

1/ Total long-term production (23 Years) under proper use by animal class for each allotment which would be attained under each proposed management system. Example: If the Bar X Allotment was grazed by cattle only, the proper use within 23 years would be 1,086 AUMs; if grazed by sheep only, proper use would be 1,245 AUMs; if grazed by pronghorn antelope only, proper use would be 697 AUMs; etc.

2/ This column represents the use within each allotment by each class of grazing animal expected at the beginning of the proposed grazing program (from TABLE 1-4 and 1-8).

3/ These AUMs represent the amount of use by each grazing animal on each allotment which is expected in the long term (23 years).

TABLE 3-16

SUMMARY OF LONG-TERM PRODUCTION AND USE COMPARISON IN AUMS AND POUNDS DRY WEIGHT FORAGE WITH PROJECTED POTENTIAL PRODUCTIVITY UNDER THE PROPOSED ACTION*

ALLOTMENT	Present Vegetal Production 1/ AUMs	Present Vegetal Production 1/ Pounds	Maximum Potential Productivity 2/ AUMs	Maximum Potential Productivity 2/ Pounds	Production Potential In 23 Years 3/ AUMs	Production Potential In 23 Years 3/ Pounds	Long-Term Use 4/ AUMs	Long-Term Use 4/ Pounds
Bar X	819	638,820	2,755	8,367,980	1,086	847,080	1,059	826,020
Fish Creek	954	744,120	3,730	10,803,090	1,417	1,105,260	1,062	828,360
Gold Creek	4,110	3,205,800	20,606	81,759,637	5,339	4,164,420	5,962	4,650,360
Little Sandy-Little Prospect	15,142	11,810,760	50,666	165,269,672	18,846	14,699,880	17,710	13,813,800
Steamboat Mountain	2,097	1,635,660	12,421	38,631,491	2,513	1,960,140	2,508	1,956,240
Little Colorado:								
Green River Use Area	16,852	13,144,560	49,796	145,718,850	27,001	21,060,780	25,790	20,116,200
Farson Use Area	13,002	10,141,560	36,173	80,729,887	18,488	14,420,640	16,874	13,161,720
Big Sandy Use Area	10,502	8,191,560	36,965	98,743,840	16,740	13,057,200	16,034	12,506,520
Red Desert	18,050	14,079,000	43,918	115,032,620	20,935	16,329,300	20,586	16,057,080
Bush Rim	6,452	5,032,560	26,950	79,355,754	7,095	5,534,100	7,077	5,520,060
Continental Peak	6,254	4,878,120	27,288	75,440,160	7,254	5,658,120	6,829	5,326,620
Pacific Creek	11,146	8,693,880	61,413	178,340,170	17,223	13,433,940	14,056	10,963,680
Sands	5,487	4,279,860	15,763	49,653,555	6,291	4,906,980	5,475	4,270,500
White Acorn	5,379	4,195,620	20,148	74,676,564	7,092	5,531,760	6,380	4,976,400
Prospect Mountain	5,300	4,134,000	24,016	89,018,568	8,346	6,509,880	7,979	6,223,620
Reservoir	1,720	1,341,600	8,015	17,431,838	2,810	2,191,800	2,725	2,125,500
Poston	3,453	2,693,340	8,065	106,072,216	4,822	3,761,160	3,906	3,046,680
Pine Creek	1,209	943,020	5,993	17,429,095	1,971	1,537,380	1,470	1,146,600
TOTALS	127,928	99,783,840	454,681	1,382,821,432	175,269	136,709,820	163,482	127,515,960

* This table represents a comparative analysis of present, long-term (23 years) and maximum potential production with the long-term (23 years) proper grazing use for each allotment. All production and use for all classes of grazing animals have been converted to equivalent cattle AUMs for comparison purposes.

1/ Present total cattle production on a proper grazing capacity basis for each allotment by range site, including custodial pastures, according to the 1964-1965 Ocular Reconnaissance Range Survey which is available for review in the Rock Springs District Office.

2/ Maximum production possible on each range site under proper use within each allotment, including custodial pastures, utilizing the range site table from the SCS's Technician's Guide to Range Sites and Range Condition with Initial Stocking Rate (APPENDIX 21).

3/ Total long-term production (23 years) under proper use for each allotment, including custodial pastures, which would be attained under each proposed management system (from TABLES 3-15 and 3-21).

4/ Total long-term use (23 years); cattle, sheep, wild horses, and wildlife within each allotment. All use has been converted to a common denominator, cattle AUMs, and totaled for comparison purposes.

TABLE 3-17

PRESENT AND PROJECTED VEGETATION PRODUCTION BY ALLOTMENT UNDER THE PROPOSED ACTION IN AUMS AND POUNDS OF DRY WEIGHT FORAGE BY ANIMAL CLASS

Animal Class	Present Production AUMs2/	Present Production Pounds2/	Long-Term Production AUMs3/	Long-Term Production Pounds3/	AUM Increase	Pounds Increase	Percent Increase
Cattle	125,500	97,890,000	172,833	134,809,740	47,333	36,919,740	38
Sheep	142,861	107,145,750	196,049	147,036,740	53,188	39,890,990	37
Wild Horses1/	93,560	87,204,000	75,337	67,803,300	--	--	--
Pronghorn Antelope	146,427	117,525,777	191,123	154,045,138	44,696	36,519,361	31
Mule Deer	135,674	63,902,454	209,819	98,824,749	74,145	34,922,295	55
Elk	54,134	29,232,360	82,265	44,423,100	28,131	15,190,740	52
Moose	7,629	4,119,660	10,609	5,738,860	2,980	1,619,200	39

1/ The figures indicate a decrease in production for wild horses. The reason for this is the reduction of land area proposed for wild horse use. Production increases for wild horses are directly proportional to that shown for cattle (20%).

2/ From TABLE 2-24.

3/ From TABLE 3-15.

would reduce the soil permeability. This would reduce the water intake capabilities of the soil and limit the chances for seedling establishment. Trampling of new seedlings would be a possibility from this treatment. Total vegetation production under this treatment would not change for that particular year.

Improvement in forage production would be expected from Treatment B and C due to the rest given during the critical growing period as previously discussed. Allowing the bunchgrass species a chance to improve their vigor would increase their chances of competing with the less desirable species. Improved vigor is the primary element relative to increased production (Hazell 1967).

After the first or second cycle of grazing treatments, bunchgrass plants would start to increase production due to increased vigor that the rest provided. Rhizomatous plants would increase in cover to the point of producing additional livestock forage (TABLE 3-14). This increased production with no increase in livestock use would result in less utilization of key species needed to satisfy the livestock grazing use and less utilization on important wildlife shrub species. Increased livestock use would be allowed when the studies (discussed in Chapter 1) showed the additional forage could be consumed without adversely affecting other uses.

Range Condition

The grazing systems as proposed would produce an improved range condition for all animal classes (TABLE 3-18). Close examination of the present range condition data (TABLES 2-28 and 2-29) indicates that 39% (775,511 acres) of the Sandy area is in the upper range of fair and 19% (385,967 acres) is in the good condition category for cattle and 67% (1,336,202 acres) and 22% (432,544 acres), respectively, for the same categories for sheep. The vegetation types in these range condition classes contain more than 30% desirable and intermediate vegetative species. Details of the analysis are available for review in the Rock Springs District Office. The condition of the various vegetation types for each grazing animal would be expected to initially go down under Treatment A. This would occur because season-long grazing would tend to put increased pressure on the desirable species as grazing animals are selective in their grazing habits. The plant desirability list is available for review upon request from the Rock Springs District Office. Desirability, coupled with the impact of trampling and reduced litter accumulation as a result of approximately 70% utilization on grass species (Gibbens and Fisser 1975), would increase erosion.

The condition of the range would be expected to begin improvement under Treatments B and C as litter is produced, new seedlings begin their growth, and forage production is on the upswing because of improved vigor and vegetal cover. Because of the rest provided during each grazing cycle and the heavy use being rotated from pasture to pasture, overall range condition would improve in the long term for all vegetation types.

Apparent Range Trend

Apparent range trend, primarily static, should over the long term start upward on all allotments as range conditions improve (TABLE 3-19). The upward trend would be caused by increased plant vigor and cover, additional litter accumulation, and seedling establishment. This would probably occur after two or three cycles of the grazing systems.

Custodial Pastures

Establishment of these 33 fenced-off pastures as custodial management areas would see the vegetation decline in condition (TABLE 3-20). These types of pastures contain a high percent of private and State land, are relatively small in size, and generally receive heavy utilization (70% to 80%) since they are characteristically used for holding pastures or for a seasonal horse use pasture.

It is likely that these areas would be impacted by trampling due to the heavy, concentrated use they receive. Plants would be damaged, especially young seedlings, which would tend to die out. Litter accumulation would be all but eliminated since any new growth would have no chance to mature. Increased amounts of bare ground would become evident, subjecting the various vegetation types to potential wind and water erosion.

Vegetation types such as greasewood and saltbush-winterfat types are classic examples of where the previously described impacts would be most pronounced.

Meadow types receive extreme grazing pressure due to their proximity to water and the vegetation species preference. The meadow type probably would receive between 40% and 80% of the use in a custodial pasture, depending on its size relative to the total acreage of a given pasture. Plants such as willows in these vegetation types would be quickly grazed or trampled down to where only the very old and well-established plants have any chance for survival.

Vigor, considered the primary factor relative to forage production, would not be expected to be maintained at a level higher than 60% of full development under proper stocking levels. In most pastures throughout the Sandy area, vigor of the forage species would not reach a level higher than 40% to 50% of full development on most types due to the unmanaged grazing common to the custodial pasture concept.

Forage Production

Production for each custodial pasture was determined in the same manner as described for the allotments in APPENDIX 21. Based on the management proposed for each of these pastures and their present condition by animal class, the production (TABLE 3-21) would be expected to remain about the same or possibly drop slightly. See TABLE 2-25 for a production information sum-

TABLE 3-18

PREDICTED LONG-TERM RANGE CONDITION FOR EACH ANIMAL CLASS
BY ALLOTMENT UNDER THE PROPOSED ACTION COMPARED WITH PRESENT SITUATION

Allotment	Range Condition	Cattle Present*	Cattle Predicted	Sheep Present*	Sheep Predicted
Bar X	Good	560	1,437	3,044	4,135
	Fair	2,966	2,942	3,851	2,760
	Poor	3,369	2,516	0	0
		6,895	6,895	6,895	6,895
Fish Creek	Good	0	0	0	589
	Fair	7,237	7,237	7,237	6,648
	Poor	0	0	0	0
		7,237	7,237	7,237	7,237
Gold Creek	Good	11,151	11,574	17,893	18,060
	Fair	11,061	10,759	11,503	11,336
	Poor	8,313	8,192	1,129	1,129
		30,525	30,525	30,525	30,525
Little Sandy-Little Prospect	Good	7,093	132,722	23,060	155,098
	Fair	133,124	45,418	152,134	20,095
	Poor	45,443	7,520	10,466	20,095
		185,660	185,660	185,660	185,660
Steamboat Mountain	Good	31,908	8,145	52	9,963
	Fair	31,908	25,948	38,872	29,367
	Poor	8,629	6,443	1,613	1,207
		40,537	40,537	40,537	40,537
Little Colorado: Green River Use Area	Good	47,032	193,528	140,711	271,658
	Fair	153,683	108,502	134,701	32,115
	Poor	103,076	1,761	28,379	18
		303,791	303,791	303,791	303,791
Farson Use Area	Good	54,457	117,455	70,812	172,693
	Fair	66,961	79,405	106,830	30,503
	Poor	83,705	8,263	27,481	1,927
		205,123	205,123	205,123	205,123
Big Sandy Use Area	Good	46,642	117,845	14,158	203,061
	Fair	138,469	37,377	201,477	14,827
	Poor	32,931	2,820	2,407	154
		218,042	218,042	218,042	218,042
Red Desert	Good	61,864	169,088	63,494	187,580
	Fair	150,473	62,895	116,810	51,456
	Poor	33,038	13,392	15,071	6,339
		245,375	245,375	245,375	245,375
Bush Rim	Good	4,676	63,408	20,367	81,440
	Fair	60,545	39,147	69,282	22,614
	Poor	39,326	1,992	14,898	493
		104,547	104,547	104,547	104,547
Continental Peak	Good	40,222	79,847	9,394	80,419
	Fair	46,822	8,452	78,802	7,982
	Poor	1,434	179	282	77
		88,478	88,478	88,478	88,478
Pacific Creek	Good	85,808	171,819	9,317	195,201
	Fair	88,292	30,818	190,605	7,655
	Poor	28,756	221	2,934	0
		202,856	202,856	202,856	202,856

TABLE 3-18 (Continued)

PREDICTED LONG-TERM RANGE CONDITION FOR EACH ANIMAL CLASS
BY ALLOTMENT UNDER THE PROPOSED ACTION COMPARED WITH PRESENT SITUATION

Allotment	Range Condition	Cattle Present*	Cattle Predicted	Sheep Present*	Sheep Predicted
Sands	Good	15,479	68,343	4,824	95,935
	Fair	52,723	45,385	91,447	18,022
	Poor	46,650	1,123	18,581	895
		114,852	114,852	114,852	114,852
White Acorn	Good	333	24,091	22,617	39,868
	Fair	36,471	17,982	21,013	3,714
	Poor	9,990	4,721	3,164	3,212
		46,794	46,794	46,794	46,794
Prospect Mountain	Good	205	25,810	4,971	40,203
	Fair	39,743	32,646	58,776	25,934
	Poor	26,803	8,295	3,004	614
		66,751	66,751	66,751	66,751
Reservoir	Good	2,278	27,343	7,474	34,785
	Fair	25,677	7,895	28,071	760
	Poor	7,590	307	0	0
		35,545	35,545	35,545	35,545
Poston	Good	5,992	31,183	15,396	50,395
	Fair	25,094	19,213	35,239	240
	Poor	19,549	239	0	0
		50,635	50,635	50,635	50,635
Pine Creek	Good	623	10,841	1,210	10,841
	Fair	13,466	3,248	12,879	3,248
	Poor	0	0	0	0
		14,089	14,089	14,089	14,089
TOTAL	Good	384,415	1,314,479	428,794	1,651,925
	Fair	1,084,715	585,269	1,409,529	289,275
	Poor	498,602	67,984	129,409	26,532
		1,967,732	1,967,732	1,967,732	1,967,732

* From TABLE 2-28.

TABLE 3-19

PREDICTED LONG-TERM APPARENT RANGE TREND IN ACRES
FOR LIVESTOCK UNDER PROPOSED ACTION BY ALLOTMENT
COMPARED WITH PRESENT SITUATION

Allotment	Trend Rating	Cattle Present	Cattle Predicted*	Sheep Present	Sheep Predicted*
Bar X	Upward	0	5,455	0	2,763
	Static	6,895	1,440	6,895	4,132
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
Fish Creek	Upward	0	6,715	0	6,260
	Static	6,715	522	6,260	977
	Downward	522	0	977	0
	Marginal Use	0	0	0	0
Gold Creek	Upward	21,940	18,951	21,632	12,465
	Static	8,585	11,574	8,893	18,060
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
Little Sandy-Little Prospect	Upward	2,919	62,938	2,637	30,561
	Static	182,741	132,722	183,023	155,098
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
Steamboat Mountain	Upward	7,497	32,392	0	30,575
	Static	33,040	8,145	16,733	9,962
	Downward	0	0	0	0
	Marginal Use	0	0	23,804	0
Little Colorado:					
Green River Use Area	Upward	5,632	109,583	6,938	33,328
	Static	204,467	194,208	239,812	270,463
	Downward	93,692	0	66,041	0
	Marginal Use	0	0	0	0
Farson Use Area	Upward	17,373	87,668	51,714	32,430
	Static	175,513	117,455	134,034	172,693
	Downward	12,237	0	19,375	0
	Marginal Use	0	0	0	0
Big Sandy Use Area	Upward	794	40,196	0	14,983
	Static	210,874	177,846	213,793	203,059
	Downward	6,374	0	4,249	0
	Marginal Use	0	0	0	0
Red Desert	Upward	152,668	76,287	83,274	30,427
	Static	92,707	169,088	162,101	214,948
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
Bush Rim	Upward	68,599	40,951	72,821	23,108
	Static	35,948	63,596	31,726	81,439
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
Continental Peak	Upward	1,280	8,699	0	8,057
	Static	87,198	79,779	88,478	80,421
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
Pacific Creek	Upward	34,771	24,279	11,229	9,580
	Static	166,370	178,577	191,627	193,276
	Downward	1,715	0	0	0
	Marginal Use	0	0	0	0
Sands	Upward	18,827	46,509	2,432	19,004
	Static	54,707	68,343	98,751	95,848
	Downward	41,318	0	13,669	0
	Marginal Use	0	0	0	0
White Acorn	Upward	3,437	22,689	3,091	6,902
	Static	43,357	24,105	43,703	39,892
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
Prospect Mountain	Upward	17,066	40,910	17,675	26,500
	Static	45,216	25,841	45,815	40,251
	Downward	4,469	0	3,261	0
	Marginal Use	0	0	0	0

TABLE 3-19 (Continued)

PREDICTED LONG-TERM APPARENT RANGE TREND IN ACRES FOR LIVESTOCK UNDER PROPOSED ACTION BY ALLOTMENT COMPARED WITH PRESENT SITUATION

Allotment	Trend Rating	Cattle Present	Cattle Predicted*	Sheep Present	Sheep Predicted*
Reservoir	Upward	0	8,202	0	760
	Static	35,545	27,343	35,545	34,785
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
Poston	Upward	0	19,313	0	181
	Static	50,570	31,222	50,567	50,354
	Downward	65	0	68	0
	Marginal Use	0	0	0	0
Pine Creek	Upward	12,446	3,247	502	3,247
	Static	1,643	10,842	13,587	10,842
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
TOTAL ACRES	Upward	365,249	645,084	273,945	291,131
	Static	1,442,091	1,322,648	1,562,343	1,676,593
	Downward	160,392	0	107,640	0
	Marginal Use	0	0	23,804	0
		1,967,732	1,967,732	1,967,732	1,967,732

*It is assumed that good condition ranges would stabilize and remaining areas would still be improving.

TABLE 3-20

PREDICTED LONG-TERM RANGE CONDITION IN ACRES
FOR LIVESTOCK BY CUSTODIAL PASTURE
UNDER THE PROPOSED ACTION COMPARED WITH PRESENT SITUATION

Pasture	Condition Rating	Cattle Present	Cattle Predicted	Sheep Present	Sheep Predicted
C-1	Good	0	0	0	0
	Fair	158	158	0	0
	Poor	102	102	260	260
C-2	Good	0	0	0	0
	Fair	0	0	0	0
	Poor	105	105	105	105
C-3	Good	0	0	0	0
	Fair	215	215	215	215
	Poor	0	0	0	0
C-4	Good	0	0	0	0
	Fair	80	80	90	90
	Poor	10	10	0	0
C-5	Good	476	476	0	0
	Fair	0	0	476	476
	Poor	0	0	0	0
C-6	Good	0	0	0	0
	Fair	612	612	715	715
	Poor	103	103	0	0
C-7	Good	0	0	0	0
	Fair	570	570	570	570
	Poor	0	0	0	0
C-8	Good	0	0	0	0
	Fair	408	408	408	408
	Poor	0	0	0	0
C-9	Good	673	673	673	673
	Fair	0	0	0	0
	Poor	0	0	0	0
C-10	Good	402	402	733	733
	Fair	331	331	0	0
	Poor	0	0	0	0
C-11	Good	0	0	0	0
	Fair	915	915	915	915
	Poor	0	0	0	0
C-12	Good	0	26	52	78
	Fair	190	164	112	112
	Poor	0	0	26	0
C-13	Good	0	0	100	100
	Fair	100	100	0	0
	Poor	0	0	0	0
C-14	Good	0	0	0	0
	Fair	25	25	25	25
	Poor	0	0	0	0
C-15	Good	0	0	256	256
	Fair	2,202	2,202	2,510	2,510
	Poor	564	564	0	0

TABLE 3-20 (Continued)

PREDICTED LONG-TERM RANGE CONDITION IN ACRES
FOR LIVESTOCK BY CUSTODIAL PASTURE
UNDER THE PROPOSED ACTION COMPARED WITH PRESENT SITUATION

Pasture	Condition Rating	Cattle Present	Cattle Predicted	Sheep Present	Sheep Predicted
C-16	Good	0	0	0	0
	Fair	99	99	235	235
	Poor	136	136	0	0
C-17	Good	0	0	103	103
	Fair	430	430	442	442
	Poor	115	115	0	0
C-18	Good	0	0	0	0
	Fair	260	260	260	260
	Poor	0	0	0	0
C-19	Good	0	0	0	0
	Fair	52	52	395	395
	Poor	343	343	0	0
C-20	Good	0	0	0	0
	Fair	0	0	55	55
	Poor	55	55	0	0
C-21	Good	0	0	0	0
	Fair	640	1,310	1,641	1,975
	Poor	1,335	665	334	0
C-22	Good	0	0	0	0
	Fair	255	255	255	255
	Poor	0	0	0	0
C-23	Good	0	0	26	26
	Fair	350	350	324	324
	Poor	0	0	0	0
C-24	Good	0	0	120	120
	Fair	1,832	1,832	2,122	2,122
	Poor	410	410	0	0
C-25	Good	0	0	0	0
	Fair	0	0	3,210	3,210
	Poor	3,210	3,210	0	0
C-26	Good	0	0	0	0
	Fair	0	1,315	1,186	1,908
	Poor	2,630	1,315	1,444	722
C-27	Good	0	400	0	0
	Fair	801	606	154	682
	Poor	409	204	1,056	528
C-28	Good	0	0	0	0
	Fair	0	0	880	880
	Poor	880	880	0	0
C-29	Good	0	0	0	0
	Fair	0	380	760	760
	Poor	760	380	0	0
C-30	Good	0	0	0	2,001
	Fair	0	2,014	4,360	2,359
	Poor	4,360	2,346	0	0

TABLE 3-20 (Continued)

PREDICTED LONG-TERM RANGE CONDITION IN ACRES
FOR LIVESTOCK BY CUSTODIAL PASTURE
UNDER THE PROPOSED ACTION COMPARED WITH PRESENT SITUATION

Pasture	Condition Rating	Cattle Present	Cattle Predicted	Sheep Present	Sheep Predicted
C-31	Good	0	0	1,685	0
	Fair	0	0	0	1,685
	Poor	1,685	1,685	0	0
C-32	Good	0	0	0	0
	Fair	0	0	220	110
	Poor	220	220	0	110
C-33	Good	0	0	0	0
	Fair	90	90	90	90
	Poor	0	0	0	0
TOTAL ACRES*	Good	1,552	1,977	3,750	4,088
	Fair	10,616	14,773	22,625	23,783
	Poor	17,430	12,848	3,233	1,725
		29,598	29,598	29,598	29,598

*Actual acres in custodial pastures.

TABLE 3-21

PREDICTED LONG-TERM PRODUCTION IN AUMS AND POUNDS OF DRY WEIGHT FORAGE FOR CUSTODIAL PASTURES UNDER PROPOSED ACTION*

Pasture	Cattle		Sheep		Wild Horses	Pronghorn		Mule Deer		Elk		Moose		Pasture Totals	
	AUMs	Pounds	AUMs	Pounds		AUMs	Pounds	AUMs	Pounds	AUMs	Pounds	AUMs	Pounds	AUMs	Pounds
C-1	8	6,240	10	7,500	0	9	7,254	16	7,536	19	8,640	0	0	62	37,170
C-2	4	3,120	5	3,750	0	8	6,448	14	6,594	11	5,940	0	0	42	25,852
C-3	11	8,580	12	9,000	0	6	4,836	10	4,710	10	5,400	0	0	49	32,526
C-4	3	2,340	5	3,750	0	15	12,090	26	12,246	22	11,880	0	0	71	42,306
C-5	19	14,820	10	7,500	0	25	20,150	41	19,311	0	0	0	0	95	61,781
C-6	39	30,420	23	17,250	0	43	34,658	79	37,209	0	0	0	0	184	119,537
C-7	32	24,960	20	15,000	0	40	32,240	69	32,499	0	0	0	0	161	104,699
C-8	52	40,560	58	43,500	0	32	25,792	66	31,086	0	0	27	14,580	235	155,518
C-9	84	65,520	83	62,520	0	54	43,524	98	46,158	143	77,220	26	14,040	488	308,982
C-10	84	65,520	83	62,520	0	57	45,942	104	48,984	159	85,860	29	15,660	516	324,486
C-11	115	89,700	118	88,500	0	101	81,406	221	104,091	0	0	69	37,260	624	400,957
C-12	28	21,840	27	20,250	0	16	12,896	32	15,072	48	25,920	14	7,560	165	103,538
C-13	17	13,260	17	12,750	0	8	6,448	17	8,007	29	15,660	10	5,400	98	61,525
C-14	2	1,560	2	1,500	0	2	1,612	4	1,884	0	0	0	0	10	6,556
C-15	275	214,500	313	234,750	0	220	177,320	403	189,813	0	0	159	85,860	1,370	902,243
C-16	25	19,500	29	21,750	0	19	15,314	36	16,956	0	0	14	7,560	123	81,080
C-17	31	24,180	50	37,500	0	49	39,494	83	39,093	35	18,900	29	15,660	277	174,827
C-18	16	12,480	23	17,250	0	21	16,926	38	17,898	40	21,600	12	6,480	150	92,634
C-19	32	24,960	39	29,250	0	33	26,598	59	27,789	67	36,180	21	11,340	251	156,117
C-20	4	3,120	5	3,750	0	5	4,030	8	3,768	9	4,860	2	1,080	33	20,608
C-21	211	164,580	243	182,250	0	163	131,378	303	142,713	55	29,700	114	61,560	1,089	712,181
C-22	53	41,340	34	25,500	0	31	24,986	59	27,789	0	0	0	0	177	119,615
C-23	43	33,540	33	26,250	0	32	25,792	64	30,144	0	0	0	0	172	115,726
C-24	332	258,960	277	207,750	0	276	222,456	509	239,739	0	0	35	18,900	1,429	947,805
C-25	132	102,960	153	114,750	0	297	239,382	523	246,333	19	10,260	11	5,940	1,135	719,625
C-26	177	138,060	161	120,750	0	162	130,572	306	144,126	337	181,980	39	21,060	1,182	736,548
C-27	84	65,520	85	63,750	0	78	62,868	143	67,353	155	83,700	17	9,180	562	352,371
C-28	108	84,240	74	55,500	0	90	72,540	167	78,657	0	0	8	4,320	447	295,257
C-29	67	52,260	72	54,000	0	56	45,136	105	49,455	128	69,120	34	18,360	462	288,331
C-30	277	177,060	262	196,500	0	379	305,474	677	318,867	248	133,920	31	16,740	1,824	1,148,561
C-31	95	74,100	106	79,500	0	128	103,168	196	92,316	0	0	10	5,400	535	354,484
C-32	13	10,140	14	10,500	0	15	12,090	25	11,775	0	0	2	1,080	69	45,585
C-33	5	3,900	8	6,000	0	6	4,836	10	4,710	0	0	0	0	29	19,446
PASTURE TOTALS	2,428	1,893,840	2,454	1,842,540	0	2,476	1,995,656	4,511	2,124,681	1,534	826,740	713	385,020	14,116	9,068,477

*Use figures are not available; see TABLE 3-15.

mary for each custodial pasture. Predicted apparent trend is shown on TABLE 3-22.

No Grazing in Palmer Draw

Livestock grazing of this area has been discontinued and only wildlife make use of the area. Elk use of the area occurs primarily during the fall and winter season. The limited grazing pressures occurring during the critical spring growing season should allow vegetation to attain its full vigor potential within the short-term period.

Plant composition would change slowly because of the lack of seed trampling but should change to reach the potential for the site over the long term. Long-term production should decline 10% because of the lack of new plants. This would occur as old plants become stagnated because of old growth accumulations and lower ground temperatures, retarding early growth.

A low production area would be apparent inside the Palmer Draw area over the long term when compared with adjacent areas receiving planned rest and grazing treatments. The area would be very similar to many of the range closures found around the Sandy area relative to production capability.

Range Improvements

Water Developments

Water developments are the key to making the grazing systems work. Water availability allows livestock to utilize previously unavailable forage and thus reduce grazing pressure on areas near existing water sources. The establishment of new watering facilities would cause heavy utilization to occur in a new area which was at one time not impacted. With no increase in livestock use, the new waters would reduce the heavy use around an existing watering source (TABLES 2-6 and 3-5). The degree of relief would be dependent upon the distance between the various developments, which is directly related to the number within a given area.

The degree to which a concentration area is utilized is entirely dependent upon the amount of available water within a given area. There would be between 70% to 90% utilization around these watering facilities for up to one-quarter mile radius (125 acres) and 50% to 70% utilization occurring as far as one and one half miles from the facility. Well-distributed watering facilities allow for good cattle distribution, which in turn would reduce the degree of utilization around a well, spring, reservoir, or other improvement.

Construction of reservoirs and well site developments where tanks are buried completely removes the vegetation on the specific site. The well drilling and production equipment installation along with spring developments and pipeline construction would have a negligible effect on the vegetation. The primary impact would be from compaction of the soil by heavy equipment, which is the same as a trampling effect and which would be practically negligible over the short term and long term. Growth would be slowed up for a year if the vegetation is damaged to any extent. A total of 266 acres of land would be expected to be denuded of vegetation as a result of water development construction for a total loss of 16 AUMs Sandy area wide. This loss would be spread out in all allotments, and the reduction in grazing capacity would not affect the proposed use in any one allotment over the long term.

Maintenance of these facilities, primarily on wells, springs, and pipelines, generally involves a yearly inspection, if not more frequent visits. The trampling effect after two or three years would create a two-track trail where vegetation eventually would die out depending upon the growth habit of a type. There would be fast recovery with the meadow type and slow recovery with greasewood or saltbush-winterfat types. The acreage loss of vegetation from this effect would be approximately one acre per one mile or a total of 62 acres. The major loss of vegetation would be 40 acres in the sagebrush-grass type (approximately 4 AUMs). The balance would occur in the saltbush-winterfat type (1 AUM) and a combination of other types (1 AUM). This loss should be reduced by half over the long term as the tracks heal after the initial construction activity.

Fence Construction

Impacts to the vegetation from the actual fence construction would be negligible. Maintenance of the fence where vehicle access would be available would cause impacts similar to those identified for the watering facilities.

Fence lines would create major livestock and wildlife corridors where the animals trail, seeking a way through the fence or where the fence line leads to a watering facility. New, unfamiliar surroundings for livestock, especially those caused by the construction of a new fence, would limit their natural traveling habits. This could cause them to nervously trail along the length of a fence. Approximately 268 acres of vegetation would be disturbed from trailing damage along the proposed fences with a total loss of 16 AUMs area-wide.

Vegetation would reestablish in these trails as the livestock and wild horses would become more accustomed to their limited range and would not tend to return to their historical area of use. Two factors contribute to the animals doing less trailing along fences: (1) life-sustaining requirements—forage and water—would be readily available and (2) the older homing animals would be replaced by younger animals accustomed to the new surroundings.

Threatened and Endangered Plants

As discussed in Chapter 2, two plants on the proposed list of endangered plant species *(Federal Register* 41:24524 24572) were collected in the Sandy area in the

TABLE 3-22

PREDICTED LONG-TERM APPARENT RANGE TREND IN ACRES
FOR LIVESTOCK BY CUSTODIAL PASTURE
UNDER THE PROPOSED ACTION COMPARED WITH PRESENT APPARENT RANGE TREND

Pasture	Condition Rating	Cattle Present	Cattle Predicted	Sheep Present	Sheep Predicted
C-1	Upward	0	0	0	0
	Static	260	260	132	132
	Downward	0	0	128	128
	Marginal Use	0	0	0	0
C-2	Upward	0	0	0	0
	Static	105	105	28	28
	Downward	0	0	77	77
	Marginal Use	0	0	0	0
C-3	Upward	0	0	0	0
	Static	215	215	215	215
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-4	Upward	0	0	0	0
	Static	90	90	90	90
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-5	Upward	0	0	0	0
	Static	476	476	476	476
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-6	Upward	0	0	0	0
	Static	715	715	715	715
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-7	Upward	0	0	0	0
	Static	570	570	570	570
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-8	Upward	408	408	0	0
	Static	0	0	408	408
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-9	Upward	673	673	673	673
	Static	0	0	0	0
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-10	Upward	733	733	733	733
	Static	0	0	0	0
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-11	Upward	0	0	0	0
	Static	915	915	915	915
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-12	Upward	26	26	0	0
	Static	164	164	190	190
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-13	Upward	0	0	0	0
	Static	100	100	100	100
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-14	Upward	0	0	0	0
	Static	25	25	25	25
	Downward	0	0	0	0
	Marginal Use	0	0	0	0

TABLE 3-22 (Continued)

PREDICTED LONG-TERM APPARENT RANGE TREND IN ACRES
FOR LIVESTOCK BY CUSTODIAL PASTURE
UNDER THE PROPOSED ACTION COMPARED WITH PRESENT APPARENT RANGE TREND

Pasture	Condition Rating	Cattle Present	Cattle Predicted	Sheep Present	Sheep Predicted
C-15	Upward	0	0	0	0
	Static	2,766	2,766	2,766	2,766
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-16	Upward	0	0	0	0
	Static	235	235	235	235
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-17	Upward	0	0	0	0
	Static	545	545	545	545
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-18	Upward	0	0	260	260
	Static	260	260	0	0
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-19	Upward	0	0	0	0
	Static	395	395	395	395
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-20	Upward	0	0	0	0
	Static	55	55	55	55
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-21	Upward	1,514	1,514	104	104
	Static	461	461	1,871	1,871
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-22	Upward	0	0	0	0
	Static	255	255	255	255
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-23	Upward	0	0	0	0
	Static	350	350	350	350
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-24	Upward	0	0	0	0
	Static	2,242	2,242	2,242	2,242
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-25	Upward	0	0	0	0
	Static	3,210	3,210	3,210	3,210
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-26	Upward	2,630	2,630	2,297	2,297
	Static	0	0	333	333
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-27	Upward	1,210	1,210	1,056	1,056
	Static	0	0	154	154
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-28	Upward	0	0	0	0
	Static	803	803	880	880
	Downward	77	77	0	0
	Marginal Use	0	0	0	0
C-29	Upward	760	760	760	760
	Static	0	0	0	0
	Downward	0	0	0	0
	Marginal Use	0	0	0	0

TABLE 3-22 (Continued)

PREDICTED LONG-TERM APPARENT RANGE TREND IN ACRES FOR LIVESTOCK BY CUSTODIAL PASTURE UNDER THE PROPOSED ACTION COMPARED WITH PRESENT APPARENT RANGE TREND

Pasture	Condition Rating	Cattle Present	Cattle Predicted	Sheep Present	Sheep Predicted
C-30	Upward	4,027	4,027	4,002	4,002
	Static	333	333	358	358
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
C-31	Upward	0	0	0	0
	Static	0	0	0	0
	Downward	1,685	1,685	1,685	1,685
	Marginal Use	0	0	0	0
C-32	Upward	0	0	0	0
	Static	0	0	0	0
	Downward	220	220	220	220
	Marginal Use	0	0	0	0
C-33	Upward	0	0	0	0
	Static	90	90	90	90
	Downward	0	0	0	0
	Marginal Use	0	0	0	0
TOTAL ACRES	Upward	11,983	11,983	9,625	9,625
	Static	15,633	15,633	17,863	17,863
	Downward	1,982	1,982	2,110	2,110
	Marginal Use	0	0	0	0
		29,598	29,598	29,598	29,598

early 1900's. Exact locations are not known, and more recent forage surveys did not provide additional information.

Formal consultation under Section 7 of the Endangered Species Act of 1973 has been initiated with the U.S. Fish and Wildlife *Service.*

Lesquerella *macrocarpa* is a perennial forb known to occur on naked clay flats and ridges (Nelson 1902, Payson 1921, Rollins and Shaw 1973). It was found in the Steamboat Mountain, Bush Rim, and Continental Peak Allotments, but it was not being impacted by livestock grazing. However, the population in the Continental Peak Allotment has almost been destroyed by trampling from the present population of wild horses. Under the proposed action, the wild horse number using the three allotments where this plant has been found would be reduced, thus relieving some of the trampling damage in the Continental Peak *Allotment.*

Antennaria *arcuata* is a perennial forb believed to be found in meadows of the mountain shrub type. Flowering probably occurs in late July and early August. *Antennaria arcuata* reproduces vegetatively by means of stolons (see Glossary; Cronquist 1950; Hitchcock et al. 1955). This plant may occur in the Fish Creek or Bar X Allotments. No detrimental impacts are anticipated as a result of the proposed grazing treatments in these allotments. Improved range condition eventually resulting from periodic rest or deferment could have a positive impact in the long term.

These plant species would respond to the proposed grazing treatments in a manner similar to plant species with similar growth characteristics and habits. Monitoring studies (Chapter 4 Terrestrial Wildlife and Vegetation) would be established on all known threatened and endangered plant areas to study the impact of the proposed action on those plant species. Modification of the grazing systems or additional protective measures (fencing) would be determined from these studies.

Summary and Conclusions

Because studies do not exist in the Sandy area, changes in vegetation production, condition, trend, cover, and composition cannot be exactly predicted. Estimates of impacts on vegetation stated in this FES are based on professional judgment and cited studies. Overall vegetative conditions would be anticipated to improve in the long term under the proposed action because of the planned grazing treatments. The average percent ground cover in the grass type would increase 3%, while the average percent vegetal cover would increase 2% in the mountain shrub vegetation type. All other vegetation types would experience similar increases in both ground and vegetal cover. The degree of response would depend on the soils, precipitation, and type of grazing system. Percent ground cover and vegetal cover would increase on most vegetative sites (TABLE 3-23) over the long term.

Plant composition in most types would not show a dramatic change except in those areas in poor condition because of overgrazing. The more dramatic changes would occur on the better soil sites (MAP 2-2 and soils section). Very little change would occur within the saltbush-winterfat and greasewood types. No change in acreage of types would occur.

Ecological range condition relative to site potential should improve because of increased litter, improved vigor, and seeding establishment of desirable forage species. The forage condition should improve for all animal classes. Changes would be expected to be slower in the allotments under the two-pasture and four-pasture alternately grazed systems. Apparent trend would be upward over the long term on most vegetation types. The trend would be expected to remain about static in the Farson and Big Sandy Use Areas of the Little Colorado Allotment, where big sagebrush is the key species.

In the custodial pastures, heavy utilization (70% to 80%) should continue for the long term. Forage production would be expected to remain at about the same level as present production. Ecological range condition would be expected to slowly decline over the long term because of the continuous heavy grazing year after year.

The no grazing area (Palmer Draw) would have an immediate response of improved vigor and production. Over the long term, production would decline as much as 10% as the site approaches the climax state.

Range improvements over the long term should have a major impact on the vegetation. New water developments would reduce the grazing intensities present around existing water sources as well as reduce the overall grazing intensity of the allotments. The disturbance and destruction of vegetation during construction and maintenance of the new water developments and fences would be minor. New fences could cause excessive trailing along fence lines, but this would be a short-term impact which would be eliminated when cattle become accustomed to their new and limited range.

WILDLIFE

Terrestrial

Assumptions

It is assumed that severe winter weather such as that which occurred during the winter of 1971-1972 or drought conditions would intensify the impacts identified herein. Mortality during the winter of 1971-1972 ranged between 43% and 75% of the estimated big game populations within the Sandy area. Future mortality could exceed 75% with the fencing proposed should these conditions reoccur (Julian 1973).

The impacts of livestock grazing on wildlife habitat in the Sandy area are dependent upon the combined effects of several elements within the proposed action (e.g., the number and class of livestock per allotment, season and duration of use, the length of rest, range improvements,

TABLE 3-23

PRESENT AND PROJECTED PERCENT GROUND COVER AND VEGETAL COVER BY VEGETATION TYPE

	Present 2/		Projected Under Proposed Action 3/	
	Average % Ground Cover 1/	Average % Vegetal Cover 1/	Average % Ground Cover 1/	Average % Vegetal Cover 1/
Sagebrush-Grass	38	15	44	15
Saltbush-Winterfat	35	10	35	11
Greasewood	33	12	33	12
Meadows	71	26	77	28
Grass	27	16	30	17
Perennial Forb	15	11	16	11
Mountain Shrub	77	16	82	18
Conifer	72	9	76	9

1/See glossary.

2/From TABLE 2H-1 in APPENDIX 2H.

3/From TABLE 3-14.

etc.). The effects on wildlife habitat would subsequently influence wildlife populations as well.

The possibility exists for an increase in transference of diseases and/or parasites in wildlife and livestock within smaller pastures because of the increased concentration of grazing animals (Buchanan 1951, Chandler 1961, Stauber 1976). There is also the possibility of increasing the degree and type of pestilence whenever a conversion of livestock class occurs.

Concentration of animals increases the possibilities of contracting disease and parasite host infestations from feces or urine-contaminated forage and water (Buchanan 1951, Stauber 1976). Some diseases are also transferred through injections of the causative pathogenic organism from bites of mosquitoes, flies, and ticks (Chandler 1961).

Changes in populations of big game species would primarily be affected by forage availability during critical winter and spring periods. The primary factors considered for each big game species are proposed fencing in relation to seasonal movement of wildlife to winter habitat in adjacent allotments and pastures and utilization of crucial winter habitat by livestock, which could result in a reduction of available forage.

TABLE 3-39 summarizes the impacts of fences (including existing fences) by allotment and wildlife species. Specific impacts to crucial winter habitat are shown for each big game species and are summarized in TABLE 3-40. These tables are located in the summary portion of the wildlife section.

Pronghorn Antelope

There are approximately 9,500 pronghorn antelope (referred to as pronghorn throughout this section) which use the Sandy area on a yearlong basis requiring over 7,800 AUMs of forage or about 114,600 animal months (TABLE 2-36). All sixteen proposed allotments provide summer habitat for pronghorn. Winter habitat is more limited in comparative size (MAP 2-22). The Little Sandy-Little Prospect, Little Colorado, Pacific Creek, Sands, and Reservoir Allotments and pastures which provide crucial winter habitat are tabulated on TABLE 2-38.

Populations. Prior to implementation of the proposal, the pronghorn population would be expected to increase to the desired population levels established by the Wyoming Game and Fish Department. This would mean an increase from the estimated current population level of 9,500 animals to approximately 9,900 animals. With the proposed action it is estimated that the average Sandy area pronghorn population would decrease approximately 5% (500 animals) below the desired population level. This would establish the population at approximately 9,400 animals, or 1% less than the existing population of 9,500 animals.

Habitat. There are approximately 214,000 acres of crucial pronghorn habitat (TABLE 3-24) located in the Farson and Big Sandy Use Areas of the Little Colorado Allotment and the Little Sandy-Little Prospect, Pacific Creek, Sands, and Reservoir Allotments. The crucial winter habitat condition would not be expected to improve due to the fencing and addition of waters for summer use in crucial winter habitat areas. Projected increases in vegetal cover would increase forage production over the long term; however, the proposed fences would be expected to increase mortality during the winter (Taylor 1975). Comparison of the relationships between habitat enhancement through improved food and water availability in summer habitat against the detrimental effects of fencing and water development in crucial winter habitat are difficult to predict; however, based on available information, professional judgment was used to quantify the most tangible variables on TABLE 3-24. This table compares forage production with forage requirements in crucial habitat. Vegetation lost through surface disturbance during construction of proposed range improvements, including two-track trails in crucial winter habitat, would be insignificant since less than 15% of the 923 acres would occur within the crucial winter habitat.

Food. Until the allotments presently containing extensive nonuse (TABLE 2-70) are brought into phase with the intensive management systems proposed, the anticipated range condition would not be realized and forage availability for pronghorn would decrease during the short term. While the present forage availability appears to be sufficient, production is calculated on a summer seasonal basis and vegetal biomass is not replaced during the winter. Available forage would also be further reduced by approximately 18% due to snow depth. These decreases in forage availability in crucial winter habitat would have the greatest impact on pronghorn during the winter.

The important use areas of the crucial winter habitat are generally along draws and their adjacent slopes where snow accumulation is usually less. Livestock concentrate on the bottoms and around available water and consume a large amount of forage in these important pronghorn wintering areas.

The proposed livestock use of crucial winter habitat within the following pastures would result in increased forage competition with pronghorn during the short term:

1. Pastures 2 and 3 of the Farson and Big Sandy Use Areas.
2. Pastures 2 and 3 of the Reservoir and Little Sandy-Little Prospect Allotment.
3. Pasture 3 of the Pacific Creek Allotment.
4. Pastures 1, 2, and 3 of the Sands Allotment.

Forage availability would be expected to increase the carrying capacity of the crucial winter habitat in the Sandy area over the long term (TABLES 3-15 and 3-24). An average of 10,674 AUMs (TABLE 3-24) of forage would still be available on pronghorn crucial winter habitat after livestock have been removed. This takes into account a reduction of available forage during the grazing season. Herbage removed by livestock from shrubs late in the growing season would not be replaced; however, sufficient forage overall would be produced throughout the growing season on pronghorn crucial winter habitat.

TABLE 3-24

FORAGE PRODUCTION AND FORAGE REQUIREMENTS IN CRUCIAL WINTER HABITAT AREAS*

PRONGHORN ANTELOPE

Allotment	1.[1/] Total Habitat (Acres)	2. Crucial Habitat (Acres)	3. Crucial Habitat % of Total	Forage Production in AUMs: 4. Total Habitat	Forage Production in AUMs: 5. Crucial Habitat	Competitive Forage in AUMs: 6. Cattle and Horses (Wild & Domestic)	Competitive Forage in AUMs: 7. Sheep	Competitive Forage in AUMs: 9. Mule Deer	Competitive Forage in AUMs: 10. Elk	Competitive Forage in AUMs: 11. Moose
Little Sandy-Little Prospect	192,005	29,440	15	26,001	3,900	22	20	20	7	1
Little Colorado: Farson Use Area	205,123	25,120	12	17,936	2,152	1	59	0	0	0
Big Sandy Use Area	218,042	73,360	34	17,904	6,087	44	298	8	0	0
Pacific Creek	204,615	39,040	19	21,380	4,062	19	60	5	2	0
Sands	115,215	34,240	30	9,683	2,905	33	15	7	3	0
Reservoir	36,150	12,800	35	4,875	1,706	3	66	12	0	0
TOTALS	971,150	214,000	22	97,779	20,812	122	518	52	12	1

Allotment	12. Forage Production (AUMs)	13. Reduction for Fencing (AUMs)	14. Increase in Competitive AUMs Under Intensive Management	15. Snow Cover Reduction (AUMs)	Additional Water Developments: 16. Severe & Heavy Grazing Intensity	Additional Water Developments: 17. Extended Wildlife Occupation	18. Totals of Production (AUMs)	19. Available Forage After Reductions	% of Crucial Habitat: 20. With Adequate Forage	% of Crucial Habitat: 21. Without Adequate Forage
Little Sandy-Little Prospect	560	1,092	3		17	44	1,786	+2,114		
Little Colorado: Farson Use Area	466	603	5		11	35	1,180	+ 972		
Big Sandy Use Area	500	1,704	26		43	38	2,661	+3,426		
Pacific Creek	1,061	1,137	6		54	80	2,424	+1,638		
Sands	389	813	4		33	30	1,327	+1,578		
Reservoir	150	478	5		34	12	760	+ 946		
TOTALS	3,126	5,827	49		192	239	10,138	+10,674	100[2/]	0

* Information on this table is symbolic of conditions which should be considered, but the numerical values would not necessarily be representative of the actual situation. This is due to the unpredictability of environmental factors as discussed in the Chapter 3 wildlife section. The following statement from the Wyoming Game and Fish Department (1976) concerning wildlife forage reservations in the Sandy area vividly addresses the problem:

> Data weighted or broken down by allotment or pasture would result in a cumulative error in forage allocations, as annual climatic and forage variables would create shifts in wildlife use over time and space. Accommodating the extreme ranges of variation in use, which might be observed on small land areas such as allotments over time, could result in either a greatly inflated or deflated allocation figure.

The methodology and procedures for obtaining the values in Columns 1 through 21 are explained in APPENDIX 3C.

1/ Total habitat includes custodial pastures, Federal withdrawals, and no livestock grazing area with habitat.

2/ This only covers the forage availability on crucial winter habitat during an average winter, and does not include severe winter conditions.

Grazing Treatments. Treatment A grazing (graze season long) could initially cause a slight downward trend in the pronghorn population because of proposed livestock conversions, activation of present nonuse, and the proposed grazing systems which would periodically concentrate livestock on approximately one-third to one-half of the area being utilized.

As an example, in Year 1 two pastures in the Big Sandy Use Area of the Little Colorado Allotment and two in the Sands Allotment contain crucial winter habitat (MAP 2-22) that would receive Treatment A. Approximately 10% (22,448 acres) of the pronghorn crucial winter habitat would receive Treatment A. During this treatment approximately one-third of the allotment would receive more intensive livestock use than presently occurs under season-long grazing. This would result in heavy livestock use of wet meadows and springs, reducing the volume of vegetation available. Riparian areas are among the first areas grazed by livestock. These areas are frequently important crucial winter habitat for pronghorn.

During a year of heavy snowfall when the valley floors are snow-covered, the amount of forage available is critical, especially with crusted snow. The taller plants, especially sagebrush, become even more important under these conditions as they stick out above the snow and provide the only available forage (Pronghorn Antelope Workshop 1976).

Without previous rest, the first year an allotment would be placed on a rest-rotation system, intensive use could result in short-term depletion of the winter habitat and reduced carrying capacity in grazed pastures. This impact would not be expected to occur over the long term because of anticipated increases in forage production (vegetation section). Increased water availability would to the crucial habitat (MAP 2-22). This is about 39% of the crucial winter pronghorn for available forage, except where waters are developed on crucial winter habitat.

Treatment B (rest until seedripe, then graze) occurs on an average of 82,538 acres of crucial winter habitat. As an example, in Year 1 four pastures in the Little Sandy-Little Prospect and Reservoir Allotments and the Farson and Big Sandy Use Areas of the Little Colorado Allotment would apply Treatment B to the crucial habitat (MAP 2-22). This is about 39% of the crucial winter habitat receiving Treatment B. Combining Treatments A and B, about 104,986 (49%) acres of the crucial winter habitat in the Little Colorado and Pacific Creek Allotments would be used within these allotments.

Livestock feed primarily on grasses and forbs early in the growing season, but gradually increase their browse intake during the fall. In the allotments shown above late season cattle or sheep grazing on crucial winter habitat could reduce forage availability during the winter and cause some mortality, especially among fawns. Fawn production the following spring could also be affected (Beale et al. 1969). Reduced winter forage availability due to concentrated grazing, reduced vegetation height, deep snow, and reduced migration access to forage in adjacent allotments would compound the impacts to pronghorn, resulting in undernourishment.

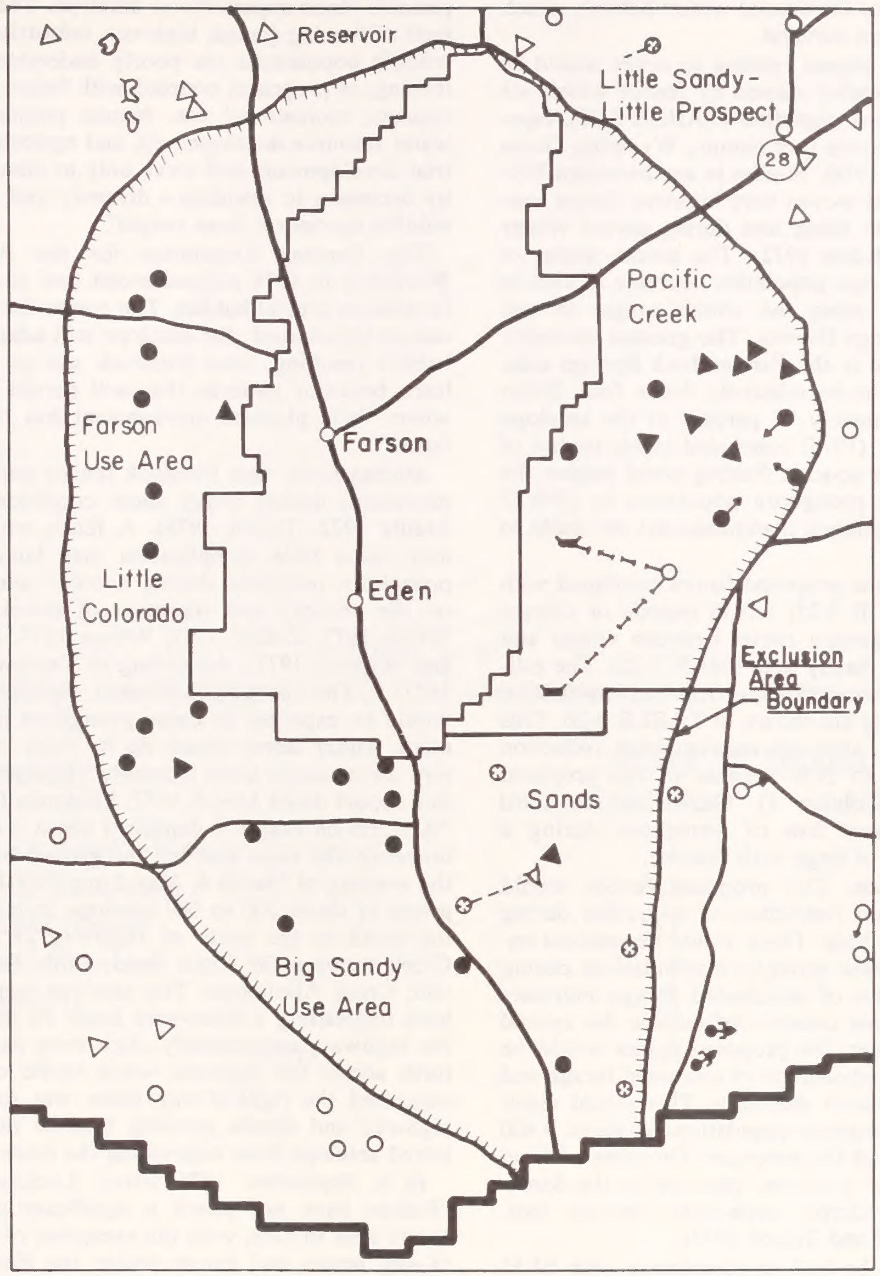
As an example, in Year 1 four pastures (235,282 acres) of the Little Colorado, Pacific Creek, and Reservoir Allotments with crucial winter habitat would receive Treatment C (rest season long). The crucial habitat within these allotments would be benefited from this treatment, and all the forage produced on the 55,204 acres of crucial habitat which would receive this treatment would be available during the winter. This would be a short-term and long-term benefit of approximately 26% of the crucial winter habitat that would receive Treatment C. Season-long rest would allow new growth and accumulation of vegetal biomass providing an increase in the availability of forage for wintering animals. This treatment is applied to between 651,980 and 677,530 acres (TABLE 1-9) annually within the Sandy area.

Treatment E (graze until seedripe, then rest) would be expected to be beneficial by eliminating grazing during the fall. It would be used in place of Treatment A in four of the eleven allotments (Red Desert, Bush Rim, Continental Peak, and Pacific Creek) utilizing the three-pasture rest-rotation systems. This treatment would provide a significant benefit to pronghorn within the Pacific Creek Allotment. As an example, Pasture 3 contains approximately 53,810 acres of crucial habitat, 25% of the total 214,000 acres of crucial winter habitat in the Sandy area (TABLE 3-24). Under Treatment E Pasture 3 would provide more volume of vegetation for wintering pronghorn than when it would be under Treatments A or B because of late season rest from livestock grazing.

Water. The 33 pit reservoirs, 6 spring developments, and 63 earthfill reservoirs proposed (TABLE 1-13 and MAP 1-5) are intended to improve livestock distribution from June through October, when arid conditions usually render much of the Sandy area unusable.

Pronghorn require open water sources with nearly the same distribution as cattle (Taylor 1965). Most of the proposed 39 wells would not benefit pronghorn from June through October since they would be turned on only when the pasture was being grazed by livestock. This would be a significant factor in the more arid areas of the Farson Use Area of the Little Colorado Allotment and the Red Desert, Bush Rim, and Continental Peak Allotments. Pronghorn would benefit from these developments during those times the wells are turned on. When waters were closed or turned off, however, stress would occur as the pronghorn would be forced to relocate.

In other allotments, proposed water developments in crucial winter habitat (MAP 3-1) could contribute to pronghorn mortality through summer utilization of winter habitat areas. There are two pit reservoirs in Pasture 2 of the Reservoir Allotment, six pit reservoirs in Pasture 1 of the Sands Allotment, and a well with four stock tanks in Pasture 3 of the Pacific Creek Allotment which would be developed on crucial winter habitat. New water sources would make 12,800 acres of land available for summer use. This area could support 653 pronghorn for four months or 218 for one year (Taylor 1975). The additional summer use could therefore reduce



LEGEND

ALLOTMENT AND PASTURE BOUNDARIES

WATER DEVELOPMENTS THAT WOULD BE EXCLUDED FROM PRONGHORN ANTELOPE USE DURING THE SUMMER, AS SUGGESTED BY THE WYOMING GAME AND FISH DEPARTMENT

EXISTING WATER DEVELOPMENTS

WELLS

SMALL PIT RESERVOIRS

SPRINGS

PROPOSED WATER DEVELOPMENTS

WELLS

EARTHFILL RESERVOIRS

PIT RESERVOIRS

RECOMMENDED PRONGHORN ANTELOPE SUMMER EXCLUSION AREAS

SANDY GRAZING

ENVIRONMENTAL STATEMENT

MAP 3-1

the carrying capacity of the crucial winter habitat, which is essential to pronghorn survival.

Cover. The primary impact relating to cover would be one of impaired availability caused by fences which act as barriers to pronghorn migration (TABLE 3-25), especially during winter storms (per comm., Wyoming Game and Fish Department 1976). Studies in southwestern Wyoming have shown that woven wire highway fences contribute to doubling the death loss during severe winter storms (Oakley and Riddle 1972). The severe winter of 1971-72 caused an average population decrease of 43% in the pronghorn herds using the winter ranges in and around the Rock Springs District. The greatest mortality of pronghorn occurred in the Farson-Rock Springs area, presently considered to be relatively fence free. Julian (1972) said, "Approximately 75 percent of the antelope herd was lost" Taylor (1975) concluded in his studies of the Red Desert that large-scale fencing could reduce the carrying capacity and pronghorn population by 28% if no improvements (vegetation manipulations) are made to the habitat.

It is estimated that the proposed fences combined with existing fences (TABLE 3-25) would impede or change typical pronghorn migration routes between winter and summer habitat in the Sandy area (MAP 2-22). The estimated losses of pronghorn resulting from implementation of the proposed fencing are shown in TABLE 3-26. This table shows a possible, although unanticipated, reduction in populations of up to 28% because of the proposed large-scale fencing (Column 1). Shown in the third column is the estimated loss of pronghorn during a severe winter because of large scale fencing.

Migration and Space. The proposed fences would create only a minimum restriction of migration during snow-free times of the year. There would be seasonal enhancement of Sandy area pronghorn populations during the summer as a result of anticipated forage increases and water developments constructed outside the crucial winter habitat. However, the proposed fences would be expected to offset the advantages of increased forage and water by increasing winter mortality. This would result in maintaining the pronghorn populations at about 9,400 animals. Construction of the proposed 536 miles of fencing to be completed on a six-year plan within the Sandy area would be considered large-scale fencing (per. comm., Lockman 1977 and Taylor 1977).

These fences would be built in compliance with BLM standards for three and four-strand barbed wire and would not have the fatal characteristics of woven wire (Russell 1951). Generally these fences would only be an inconvenience; however, they could act as a barrier during the winter when there is deep crusted snow. In a personal communication, the Wyoming Game and Fish (1976) stated:

"The antelope on these ranges are migratory. Higher elevations and areas of more adequate water availability are utilized as spring-summer-fall ranges by antelope. It is absolutely necessary that all antelope in these areas move freely to lower winter ranges. Heavy snow accumulations and drifting conditions which are not uncommon in southwestern Wyoming could make a seemingly passable fence impassable to antelope. The cumulative effects of fencing (range, highway, industrial) on migratory wildlife populations are poorly understood. Large scale fencing, as proposed, coupled with future mineral and oil impacts, recreational use, human population increases, water resource developments, and agricultural and industrial developments will serve only to disrupt the continuity necessary to maintain a diversity and productivity of wildlife species on these ranges"

The Fencing Committee for the Antelope States Workshop in 1974 recommended that no fencing should be done in crucial habitat. The committee concluded: "It cannot be assumed that antelope will adapt to changes in habitat resulting from livestock use or that they will learn behavior patterns that will permit them to thrive where their physical environment has been altered by fences"

Studies show that livestock fences impede pronghorn movement during heavy snow conditions (Oakley and Riddle 1972, Taylor 1975). A fence which one winter may cause little complication may later cause a high pronghorn mortality during another winter, depending on the severity and direction of storms (per. comm., Welch 1977, ZoBell 1977, Wilson 1977, Lockman 1977, and Mapston 1977). According to Vernimen (per. comm. 1977), "The proposed fences, especially four-strand, would be expected to cause pronghorn mortality, and a quick winter storm would do it. What little fencing we now have causes some mortality" In a personal observation report dated March 1977, Lockman (WGFD) states, "A storm on March 2 deposited about 4 inches of snow; however, the snow had left the ground by March 7" On the evening of March 6, Max Long (WGFD) observed a group of about 300 to 600 antelope trying to cross from the south to the north of Highway 28 at Dry Pacific Creek between the Little Sandy-Little Prospect and Pacific Creek Allotments. The antelope were having problems negotiating a three-wire fence on the north side of the highway; consequently, they were dashing back and forth across the highway when traffic came by. Long suggested the right-of-way fence was too close to the highway and shrubs growing beneath the fenceline deterred antelope from negotiating the fence.

In a September 1976 letter, Lockman states that: "Fences have not posed a significant problem in the Sandy area to date, with the exception of highway right-of-way fences and fences within the Eden-Farson agricultural area. The reason they have not posed a problem on rangelands to a significant degree is due to the present lack of fencing on ranges"

Direct entanglement of pronghorn in fences would be responsible for only an estimated 23% of the fence-caused mortality (Oakley and Riddle 1972). Randall (per. comm. 1977) explained, "By far the most pronghorn that die as a result of fencing are not those which become directly entangled but those which come to a fence and run up and down it until in time they are weakened, suffer from undernourishment, exposure, then die or are killed by predators"

Yoakum (1975) wrote, "Antelope have problems jumping or going through fences because historically the habi-

TABLE 3-25

EXISTING AND PROPOSED FENCING IN PRONGHORN CRUCIAL WINTER HABITAT

Allotment	Miles of Fencing	
	Existing	Additional
Little Sandy-Little Prospect	21	4
Little Colorado	42	16
Pacific Creek	11	12
Sands	9	11
Reservoir	17	3
TOTAL	100	46

TABLE 3-26

ESTIMATED LOSSES OF PRONGHORN RESULTING FROM IMPLEMENTATION OF THE PROPOSED FENCES

Allotment	Possible Reduction of Normal Population (28%) Due to Large Scale Fencing 1/ (Animals)	Anticipated Losses (0 to 3%) with Implementation of Proposed Fences 2/ (Animals)	Anticipated Losses (53%) Due to Severe Winter 3/ (Animals)
1. Bar X	11	0	23
2. Fish Creek	13	1	28
3. Gold Creek	45	2	119
4. Little Sandy-Little Prospect	289	12	613
5. Steamboat Mountain	45	2	96
6. Little Colorado	882	35	1,869
7. Red Desert	190	8	402
8. Bush Rim	123	5	260
9. Continental Peak	99	4	209
10. Pacific Creek	278	11	589
11. Sands	113	5	240
12. White Acorn	69	3	146
13. Prospect Mountain	98	4	208
14. Reservoir	54	2	113
15. Poston	53	2	113
16. Pine Creek	16	1	33
TOTAL	2,389	97	5,061 4/

1/ The 28% reduction is based on the Red Desert study (Taylor 1975) indicating the carrying capacity is reduced (migration disrupted and animals confined to smaller spaces) due to large-scale fencing.

2/ Anticipated increases in forage would offset all but approximately 3% of the 28% losses that would occur to the normal population.

3/ The 53% reduction is based on the Red Desert study (Oakley and Riddle 1972) indicating that a severe winter could cause up to a 62% reduction of the pronghorn population due to large scale fencing. Since the proposed fences would not be expected to be as restrictive as those studied, it is estimated that losses between 43% and 62% (average 53%) could occur.

4/ Based on the Red Desert study by Oakley and Riddle on average loss during the severe 1971-1972 winter, they concluded that roughly twice the mortality could occur during a severe winter in fenced areas compared to unfenced areas studied.

tat in which they developed contained no obstacles over which they had to jump. Fences became a major obstacle when antelope mobility is needed to procure food, water, or escape from deep snows. Such restrictions have led to mortality in certain areas"

In a 1954 fence study, Rouse concluded, "Fences are obstacles to the movement of antelope. Antelope have a certain amount of adaptability and learn to crawl under, or go through, or jump over fences if the type of construction permits. Ordinary barbed-wire fences used to control cattle will usually permit antelope to crawl under, as the bottom wire is frequently raised about 15 inches above the ground. Woven-wire fences are more difficult for an antelope to cross. Antelope that are unfamiliar with fences are more restrained than animals used to them. It takes considerable time for antelope to learn to cope with fences. Antelope have the natural ability to jump, but in their natural habitat are seldom required to jump over high obstacles. It takes some time for them to learn that they can jump most ordinary fences"

Age would also have an effect on how readily a pronghorn could negotiate a fence (Spillett et al. 1967). Young pronghorn would not have had the benefit of experience in negotiating fences. Oakley and Riddle (1972) report that pronghorn yearlings and fawns comprise the age group that suffers the greatest mortality during the winter. From observations in the Red Desert they concluded: "Almost any fence or device was a serious barrier to young antelope and thus fences are shown to be critical where daily or seasonal movements are mandatory to survival of a population. Adult antelope possess an inherent ability to cross fences, but 32 inches is the maximum height they will readily jump over. The 42 inch Rouse-type fence is a severe barrier to antelope. Wire fences with the bottom 15 inches off the ground posed no problem to antelope, but sheep also cross them. Sheep were effectively held by a 32-inch net wire fence consisting of 26-inch net and 1 strand of barbed wire"

In 1966 W. Hepworth and F. Blunt noted that: "The trouble with most of the fences and devices tested is that they fail to permit passage of fawns. In the event fawn movement cannot be facilitated in some areas, a great reduction of some herds was foreseen if fences are established. Some herds may have to be reduced to a level where a particular range will be adequate yearlong unless fences or devices can be found which all permit passage of all age classes. It was stressed that much work needs to be done to find fences and devices to allow movement"

Bell (1972) cautioned that interlacing of fencing for rest-rotation grazing throughout the western antelope ranges would spell certain doom for the herds as they are known today and that antelope numbers would be significantly reduced; however, it is believed that he was referring mainly to sheep-tight fencing.

Nevertheless, according to WGFD (per. comm. 1976), ". . .fences in key movement areas between summer and winter ranges and fences between a winter range and crucial winter range would be a potential hazard of even a greater magnitude" Depending on weather conditions, virtually all of proposed fencing would be hazardous to pronghorn.

The proposed 38-inch high, four-strand wire fences would act as a barrier to pronghorn without complications from snow. According to Spillet, Low, and Sill from their 1967 report of a Utah State University study done in the Red Desert area, "With few exceptions, they appeared to be unaware of their ability to jump vertical barriers and rarely jumped fences over 32 inches high unless it was a result of active pursuit or severe stresses induced by man" They also wrote, "A total fence height of 32 inches appeared to be the maximum fence height that most adult pronghorn antelope would readily cross" It appears that a 32-inch fence could act as a barrier, especially to young even in good weather. Sundstrom (1966) and Sill (1964) also advocate a maximum height of 32 inches.

The spacing between wires is also important since pronghorn go through or under the wires of a fence if possible. The 12-inch spacing between the top barbed wires is too narrow to permit the passage of antelope without inflicting injuries (Spillet, Low, and Sill 1967; Rouse 1954). The maximum spacing between any of the wires in the fencing proposal is 12 inches (FIGURES 1-9 and 1-10). The proposed 271 miles of four-strand wire fence amounts to over 50% of the total 536 miles of proposed fencing. The proposed four-wire fences would be too high for pronghorn to jump (especially the young), and the spacing between wires would inflict injury to pronghorn that try to pass between the wires. The four- and three-strand barbed wire fences do have a smooth bottom wire to allow pronghorn to go under. The bottom wire on the four-strand fence would be 10 inches above ground, thus complying with the BLM manual; however, there is some doubt that 10 inches would readily allow passage. Cole (1956) wrote that "wires 9.5 inches above ground stopped antelope movements" In 1948 Einarsen concluded that a 12-inch clearance would allow passage--any higher would probably enable sheep to slip through. Wire fences with the bottom wire 15 inches above the ground posed no problem to antelope, but sheep also crossed them (Hepworth and Blunt 1966).

Another consideration in relation to possible improved passage under a fence would be snow accumulation, especially in crusted conditions. A crusted snow of 6 to 7 inches would reduce the proposed 16-inch gap under the proposed three-strand barbed wire fence to 9 to 10 inches, which would stop passage. The critical season of pronghorn movement in the Sandy area is winter, and any additional stress would increase the risk of mortality. A combination of the existing and proposed fencing would cause mortality during an average winter (43 to 75%) and drastic mortality in any winter as severe as those in 1948-49 or 1971-72 (over 75%). The custodial pastures and Palmer Draw area are not included in the pronghorn crucial winter habitat; therefore, no impacts would be anticipated.

Mule Deer

Populations. With implementation of the proposed action, it is estimated that the average deer population would increase between 10 and 20% (520 and 1,040 animals) above the current population (5,200 animals). This is approximately 15% below the 7,400 animal population level desired by the Wyoming Game and Fish Department.

Habitat. The crucial winter habitat of mule deer is important to their welfare, and the condition and availability of forage are important factors in survival. TABLE 3-27 compares forage production with forage requirements and shows the available remaining forage in the crucial habitat.

Peripheral areas of deer summer habitat would become more accessible with the addition of water and increased forage. The additional water development on crucial winter habitat may result in a decreased winter carrying capacity because of combined mule deer use (not presently occurring) and increased livestock use during the preceding summer. The existing and proposed fences would be expected to contribute to the winter losses by restricting movement, etc. as described for pronghorn. Proposed fences and water developments would cause minimal adverse problems to deer during the summer. Increased available forage during the winter would be expected to increase the grazing capacity of the crucial winter habitat over the long term (TABLES 3-15 and 3-27). An average of 17,121 AUMs of forage would still be available on the deer crucial winter habitat after livestock have been removed. This takes into account areas that currently do not receive much livestock use. The reason for this is lack of water and reduction of available forage due to livestock utilization during the growing season. Herbage removed from shrubs late in the growing season would not be replaced; however, forage would be adequate in all habitat areas except Bush Rim, where a deficit of 250 AUMs would be expected.

The impacts to the crucial winter habitat for mule deer would be the same as those identified for pronghorn. The factors affecting population stability most are food, water, cover, space, and migration. The primary considerations in the proposal affecting these factors would be the grazing systems and range improvements. In short, the populations are a function of habitat.

There are approximately 249,984 acres of deer crucial winter habitat (TABLE 3-27) located in the Little Sandy-Little Prospect, Steamboat Mountain, Bush Rim, Pacific Creek, Sands, Prospect Mountain, and Poston Allotments. The vegetation removed during construction of the proposed range improvements, including two-track trails, in crucial winter habitat would be insignificant since less than 50% of the 923 acres disturbed would occur within the crucial habitat.

Food. Forage increases projected for the Sandy area in the vegetation section are shown on TABLE 3-15 and 3-16. Anticipated distribution of cattle and less intensified use along riparian areas and adjacent slopes would lessen grazing pressure on areas of crucial winter habitat. Mule deer would continue to use the riparian areas, side hills, and ridges depending on the best available forage. Deer prefer a southern exposure where deep snow does not accumulate in the winter and more vegetation is available. During winter, however, grazing would occur wherever forage is available.

Cattle compete for forage more directly with mule deer than with pronghorn, and their increased distribution could impact deer winter range during the short term. Concentrated livestock use could alter the winter forage availability for mule deer in search of food in deep snow. Depleted winter range could cause malnutrition in the deer; if this occurs early in the winter, fertile does could lose about 30% of the young, even if spring forage is plentiful (Dasmann 1971). Winter is the critical time for individual survival and also has a significant role in reproductive success. The carrying capacity of the crucial wintering area in the short term would decrease by approximately 10% affecting the populations proportionally.

Grazing Systems. The greatest grazing impact would be experienced from fall use. Treatment A (season-long grazing), Treatment B (rest then graze after seedripe), and Treatment D (rest then graze after peak of flowering) allow late grazing use. This is the time of year when livestock graze heavily on browse which mule deer depend upon the most during winter. Trainer (1975) notes, "Malnutrition appears as a major debilitating agent of young in the winter" As an example, ten pastures in the Little Sandy-Little Prospect, Steamboat Mountain, Pacific Creek, Bush Rim, Sands, Prospect Mountain, and Poston Allotments which contain crucial winter habitat (MAP 2-23) would have a combination of Treatments A and B in Year 1. Approximately 14% (34,381 acres) and 31% (76,320 acres) of the crucial winter habitat within these allotments would receive Treatments A and B, respectively. Combining Treatments A and B, 44% (110,701 acres) of deer crucial winter habitat would be used. This would reduce the winter carrying capacity. The remaining 56% (139,283 acres) of the crucial winter habitat carrying capacity would be enhanced.

The least duration of use during the grazing season, particularly fall use, and the longest amount of rest during a grazing cycle on crucial winter habitat would benefit mule deer the most. There would be variations in the effects of a grazing system from pasture to pasture and even on a yearly basis. Seasonal grazing by livestock on a portion of a pasture having had wildlife winter use would cause variations in plant consumption and in the intensity and duration of use. Therefore only generalizations can be made as to which grazing system would benefit crucial winter habitat the most. Rest-rotation grazing systems using Treatments E, B, and C (Red Desert, Bush Rim, Continental Peak, Pacific Creek, and Pine Creek Allotments) would be more beneficial than ones utilizing Treatments A, B, and C (Little Sandy-Little Prospect, Little Colorado, Sands, White Acorn, Prospect Mountain, Reservoir, and Poston Allotments) since Treatment A allows use during the fall.

There is also another important factor. Depending on weather, the boundaries of the crucial winter habitat could vary from year to year. Therefore, the crucial winter habitat shown on MAP 2-23 is considered the

TABLE 3-27

FORAGE PRODUCTION AND FORAGE REQUIREMENTS IN CRUCIAL WINTER HABITAT AREAS*

MULE DEER

Allotment	1.[1/] Total Habitat (Acres)	2. Crucial Habitat (Acres)	3. Crucial Habitat % of Total	Forage Production in AUMs: 4. Total Habitat	Forage Production in AUMs: 5. Crucial Habitat	Competitive Forage in AUMs: 6. Cattle and Horses (Wild & Domestic)	Competitive Forage in AUMs: 7. Sheep	Competitive Forage in AUMs: 8. Antelope	Competitive Forage in AUMs: 10. Elk	Competitive Forage in AUMs: 11. Moose
Little Sandy-Little Prospect	192,005	119,936	62	45,262	28,062	717	230	49	273	43
Steamboat Mountain	39,278	16,742	43	4,040	1,737	60	3	4	5	0
Bush Rim	60,266	1,536	3	4,939	148	0	0	0	0	0
Pacific Creek	204,615	33,459	16	38,218	6,115	26	27	3	4	0
Sands	114,423	24,602	22	18,691	4,112	33	5	3	4	0
Prospect Mountain	79,880	44,160	55	19,301	10,616	213	131	13	70	8
Poston	43,292	9,549	22	10,164	2,236	5	23	1	0	0
TOTALS	733,759	249,984	34	140,615	53,026	1,054	419	73	356	51

Allotment	12. Forage Production (AUMs)	13. Reduction for Fencing (AUMs)	14. Increase in Competitive AUMs Under Intensive Management	15. Snow Cover Reduction (AUMs)	Additional Water Developments: 16. Severe & Heavy Grazing Intensity	Additional Water Developments: 17. Extended Wildlife Occupation	18. Totals of Production (AUMs)	19. Available Forage After Reductions	% of Crucial Habitat: 20. With Adequate Forage	% of Crucial Habitat: 21. Without Adequate Forage
Little Sandy-Little Prospect	3,632	7,857	71	5,051	574	297	18,794	+ 9,268		
Steamboat Mountain	396	486	5	313	54	30	1,356	+ 381		
Bush Rim	307	41	0	27	0	23	398	- 250		
Pacific Creek	1,009	1,712	4	1,101	0	76	3,962	+ 2,153		
Sands	579	1,151	3	740	108	44	2,670	+ 1,442		
Prospect Mountain	1,499	2,972	26	1,911	310	119	7,259	+ 3,357		
Poston	323	626	2	402	60	24	1,466	+ 770		
TOTALS	7,745	14,845	111	9,545	1,106	613	35,905	+17,121	99.9[2/]	0.1

* Information on this table is symbolic of conditions which should be considered, but the numerical values would not necessarily be representative of the actual situation. This is due to the unpredictability of environmental factors as discussed in the Chapter 3 wildlife section. The following statement from the Wyoming Game and Fish Department (1976) concerning wildlife forage reservations in the Sandy area vividly addresses the problem:

> Data weighted or broken down by allotment or pasture would result in a cumulative error in forage allocations, as annual climatic and forage variables would create shifts in wildlife use over time and space. Accommodating the extreme ranges of variation in use, which might be observed on small land areas such as allotments over time, could result in either a greatly inflated or deflated allocation figure.

The methodology and procedures for obtaining the values in Columns 1 through 21 are explained in APPENDIX 3C.

1/ Total habitat includes custodial pastures, Federal withdrawals, and no livestock grazing areas with habitat.

2/ This only covers the forage availability on crucial winter habitat during an average winter, and does not include severe winter conditions.

normal range, but it could change yearly. Continued use of Treatment E within the current boundaries of a crucial winter habitat while continuing to allow Treatment A in surrounding allotments could cause a reduction in available forage should it be necessary for mule deer to shift to those allotments. The shift in the area of use might be equal to that of the existing crucial wintering area. Therefore, deer could end up wintering in the Farson Use Area and Big Sandy Use Area of the Little Colorado Allotment and the Sands, White Acorn, and Reservoir Allotments which utilize Treatment A. The EBC rotation grazing systems provide the most rest during a cycle and would be beneficial to crucial winter habitat. The ABC rotation grazing systems would allow the most use of deer crucial winter habitat by livestock and would be the least beneficial.

Water. Additional waters would increase livestock use on crucial winter habitat resulting in a reduction of available forage contributing to reduced mule deer populations in the Sandy area. Water availability is generally not a problem during winter since snow is the deer's main source.

Cover. Cover is one of the essential factors to survival of deer. Cover provides physical protection from harmful environmental elements, particularly during inclement weather and during fawning. It also provides concealment for escape and survival. Deer seek cover in: (1) more remote areas, (2) less accessible areas; (3) draws and canyons; or (4) vegetative growth which is high and thick enough. The proposed grazing systems could generally affect cover in the last two categories. Should the proposed grazing systems sufficiently alter the basic requirements involving food, water, cover, or space, then mule deer would have to adapt or relocate. Areas grazed by livestock must also be usable for mule deer once the livestock have been removed.

Fences as a part of the proposed grazing systems would have an effect on cover since they would act as barriers. A migration barrier, particularly during winter, would create an added stress which could lead to mortality. Mule deer already suffering from the effects of adverse conditions (malnutrition) could become sufficiently weakened to be incapable of negotiating a fence, thus either becoming entangled or unable to get to crucial winter habitat. Either situation could cause mortality. Older deer, having had experience with a fence, could learn to negotiate them under normal conditions; however, the fawns and young animals would have less ability to successfully negotiate fences. Severe weather and deep, crusted snow which could cause foot soreness (Julian 1973) could create additional stress to both young and old animals alike.

Coyote, bobcat, and cougar live in the mule deer habitat in the Sandy area. A fence could hinder escape, or an unseen fence could injure a mule deer trying to escape from a predator. Injuries from fences to antelope trying to escape predators have been observed in fence studies (Spillett et al. 1967). This would probably be applicable to mule deer. Injuries received from fences would increase the danger of infection and death (Buchanan 1951; Frobisher et al. 1956). The depth of a fence wound has been seen to be many times deeper than the length of a barb and can partially immobilize limbs (per. comm., Hunt 1977). It is not uncommon to see big game animals run into fences or to be cornered by one. Additional winter mortality would be anticipated as a result of the proposal. The resulting mortality rate cannot be quantified, but it would be related to the severity of the winter and type of habitat area.

Migration and Space. Much of what has been said about cover also applies to space requirements and the need of deer to migrate to obtain adequate food, water, cover, and space. It is anticipated that changes in migration and crucial winter habitat use areas would occur after implementing the proposal. It is felt that the grazing treatments and range improvements, primarily fences, would be most responsible for these changes (per. comm., WGFD 1976-77).

Custodial Pastures.. Generally speaking, custodial pastures C-4, 14, 17, 18, 19, 20, 24, 25, 28, and 33 within crucial winter habitat are the most important to mule deer. The vegetal condition has much to do with the value of these pastures as well as fencing and the surrounding topography. TABLE 2-29 indicates that 7,739 acres of the 7,790 acres in these custodial pastures are presently in either good or fair condition, and TABLE 2-32 indicates that 7,763 acres of these pastures are in either an upward or static trend.

No Grazing

The impact of the proposal on the mule deer that was the Palmer Draw area would probably be insignificant. It is not in crucial winter habitat so it is assumed it has a minimum value during the critical season. Should the boundary of crucial habitat shift to include it, the population would be expected to increase, since 100% of the forage could be available. Another benefit of exclusion from livestock use is that it could make this area attractive to mule deer during fawning.

Water Development. Water developed on crucial winter habitat would allow livestock use and subsequent forage removal (TABLE 3-28). This could be critical, depending on factors such as severity of the winter and amount of forage removed. Each water development would provide access to approximately 1 to 20 square miles of habitat (Stoddart and Smith 1955). Because greater amounts of forage would be removed during the summer by livestock and deer, this would cause reduced available forage for wintering deer.

These waters would open from 241,320 to 486,400 acres of mule deer crucial winter habitat to livestock, including approximately 2% of the total crucial winter habitat. This would contribute to a reduction of the carrying capacity, which would decrease the survival potential and breeding success of mule deer.

Fence Construction. Much that has been said for pronghorn about fences should be approximately the same for mule deer. The additional fences would tend to increase the death rate, especially during winter. As snow depth increases, negotiation of fences would

TABLE 3-28

PROPOSED WATER DEVELOPMENTS ON DEER CRUCIAL WINTER HABITAT

ALLOTMENT	PASTURE	PROPOSED DEVELOPMENTS
Little Sandy-Little Prospect	1	5 earthfill reservoirs, 2 pits
	2	1 earthfill reservoir, 2 pits
	3	4 earthfill reservoirs, 4 pits
	4	3 earthfill reservoirs
	5	1 reservoir
Steamboat Mountain	1	2 earthfill reservoirs and 1 pit
Sands	2	4 pit reservoirs
Prospect Mountain	1	1 reservoir
	2	2 reservoirs
	3	3 reservoirs
	4	2 reservoirs
	5	1 reservoir

TABLE 3-29

EXISTING AND PROPOSED FENCES IN
MULE DEER CRUCIAL WINTER HABITAT

		Miles of Fence	
Allotment	Pasture	Existing	Proposed
Little Sandy-Little Prospect	1	8	23
	2	11	15
	3		3
	4		1
	5		2
Steamboat Mountain	1		8
	2		1
Pacific Creek	1		7
Sands	3		6
	2		10
Prospect Mountain	1	11	
	2		22
	3	6	6
	4		4
TOTAL		36	108

become more difficult for weaker animals. This problem would be increased with any crusting of snow. Some animals would become entangled in fences, some diverted from the crucial habitat, and some would be caught by predators in moments of confusion where escape routes are obstructed. Existing and proposed fences located on crucial winter habitat (TABLE 3-29) pose the greater hazard since they would hamper the animals' mobility throughout the winter.

Approximately 36 miles of existing fence are located in mule deer crucial winter habitat. Approximately 108 miles of the proposed fencing would be located in these same areas, or three times more than the existing miles of fence. It is estimated that roughly three times the mortality presently affiliated with fencing would occur as a result of this additional fencing.

Elk

Populations. Elk populations are currently at the desired level of approximately 1,165 animals established by the WGFD (per. comm., WGFD 1976). Populations would be expected to maintain present numbers or slightly decline in the short term with implementation of the proposed action as water distribution and access to forage by livestock could reduce food availablity on elk crucial winter habitat. Elk populations would be expected to increase over the long term and be maintained at the desired level.

Habitat. There are approximately 226,505 acres of elk crucial winter habitat (TABLE 3-30) located in the Gold Creek, Little Sandy-Little Prospect, Steamboat Mountain, Red Desert, Bush Rim, Pacific Creek, Sands, White Acorn, and Prospect Mountain Allotments and the Big Sandy Use Area of the Little Colorado Allotment. Forage availability is expected to improve (TABLE 3-15 and 3-16) in the long term from improved management. Elk would benefit from the grazing systems over the long term. Cattle compete more directly with elk than they do with mule deer (TABLE 2-47). Increased water availability and distribution of cattle on elk winter habitat would reduce the availability of forage during the winter during the short term. Anticipated production increases in the vegetation section (TABLE 3-15) can be compared with forage required in crucial winter habitat (TABLE 3-30).

Increased available forage during the winter is expected to increase the grazing capacity of the crucial winter habitat over the long term (TABLE 3-15 and 3-30) for elk. An average of 4,892 AUMs of forage would still be available on the elk crucial winter habitat after livestock have been removed and reductions have been made as shown in TABLE 3-30. Two allotments would not have adequate forage for elk on crucial winter habitat. Little Sandy-Little Prospect would have 935 AUMs less than what would be needed and Red Desert, 1,549 AUMs less (TABLE 3-30). Herbage removed from shrubs late in the growing season would not be replaced. An 18% reduction of available forage due to snow cover is one of the major considerations in this analysis, as well as activation of livestock nonuse. The more forage available for elk on crucial winter habitat, the better are their chances of survival. The vegetation removed during construction of the proposed range improvements, including two-track trails in crucial winter habitat, would be insignificant since less than 20% of the 923 acres disturbed would occur within the crucial habitat.

Grazing Systems. In terms of crucial winter habitat and survival, the most critical grazing period to elk winter use would be fall use by cattle. Treatments A (season-long grazing) and B (rest until seedripe, then graze) allow late season use and thus concentrate livestock more heavily on browse which elk largely depend upon during the winter. As an example, approximately 11% (24,407 acres) and 38% (87,005 acres) of the crucial winter habitat in twelve pastures of the above allotments would receive Treatments A and B in Year 1. All of the pastures in the ten allotments which contain crucial winter habitat (MAP 2-24) have some late season livestock grazing on the crucial winter habitat during the system's cycle. Those allotments utilizing Treatments EBC (Red Desert, Bush Rim, and Pacific Creek) or Treatments EBCC (Gold Creek) would have the least duration of use during the grazing season, particularly fall use. They would have the longest amount of rest through a complete cycle of the system and would, therefore, complement shrubs on crucial winter habitat; this would benefit elk more than those using ABC or AC. There would be variations in the impact as the grazing treatments are applied to different pastures each year. There is also the important fact that crucial winter habitat boundaries do change from year to year and could possibly overlay last year's use area. Seasonal grazing by livestock on a portion of a pasture having had wildlife winter use would cause variations in plant consumption and the intensity and duration of use. Therefore, only generalizations could be made as to which grazing system would benefit elk crucial habitat the most.

Continued use of Treatment E within the current boundaries of crucial winter habitat while continuing to allow Treatment A in surrounding allotments could cause a reduction in available forage should it be necessary for elk to shift to adjacent allotments utilizing Treatment A. The shift in the area of use might be equal to that of the existing crucial wintering area. Therefore, elk could end up wintering in the Fish Creek Allotment, which utilizes Treatment A.

Treatment A (season-long grazing) could also be anticipated to permit substantial use of shrubs, grasses, and forbs in areas where elk normally winter. Available winter range of good quality is the limiting factor governing elk populations in the Sandy area. Generally the short-term impacts resulting from Treatment A would be a reduced supply of winter and spring forage for elk, which would contribute to malnutrition of elk, especially young animals, and could cause mortality.

Treatment B (rest until seedripe, then graze) would allow livestock utilization of forage species after mid-August. Combining Treatments A and B and using Year 1 as an example, about 49% (111,412 acres) of the elk crucial winter habitat would be used. This would have the potential to reduce the carrying capacity at the time

TABLE 3-30

FORAGE PRODUCTION AND FORAGE REQUIREMENTS IN CRUCIAL WINTER HABITAT AREAS*

ELK

Allotment	1.** Total Habitat (Acres)	2. Crucial Habitat (Acres)	3. Crucial Habitat % of Total	Forage Production in AUMs: 4. Total Habitat	Forage Production in AUMs: 5. Crucial Habitat	Competitive Forage in AUMs: 6. Cattle and Horses (Wild & Domestic)	Competitive Forage in AUMs: 7. Sheep	Competitive Forage in AUMs: 8. Antelope	Competitive Forage in AUMs: 9. Mule Deer	Competitive Forage in AUMs: 11. Moose
Gold Creek	23,658	3,917	17	12,427	1,648	68	0	0	5	0
Little Sandy-Little Prospect	52,049	51,072	98	9,045	2,482	1,838	345	21	351	14
Steamboat Mountain	40,840	21,786	53	3,666	1,943	343	8	4	12	0
Red Desert	38,588	38,088	99	3,192	506	1,500	289	12	23	0
Bush Rim	64,299	50,560	79	10,440	5,114	1,015	360	14	36	0
Pacific Creek	106,276	36,966	35	18,546	3,375	237	152	5	12	0
Sands	111,324	11,520	10	14,543	1,411	25	2	0	1	0
White Acorn	15,070	3,354	22	3,491	246	28	11	0	5	0
Prospect Mountain	21,284	9,242	43	3,461	476	107	55	2	9	1
TOTALS	473,388	226,505	48	78,811	17,201	5,161	1,222	58	454	15

Allotment	12. Forage Production (AUMs)	13. Reduction for Fencing (AUMs)	14. Increase in Competitive AUMs Under Intensive Management	15. Snow Cover Reduction (AUMs)	Additional Water Developments: 16. Severe & Heavy Grazing Intensity	Additional Water Developments: 17. Extended Wildlife Occupation	18. Totals of Production (AUMs)	19. Available Forage After Reductions	% of Crucial Habitat: 20. With Adequate Forage	% of Crucial Habitat: 21. Without Adequate Forage
Gold Creek	177		5	297	0	14	566	+1,082		
Little Sandy-Little Prospect	144		164	447	54	39	3,417	- 935		
Steamboat Mountain	237		26	350	35	19	1,034	+ 909		
Red Desert	3		134	91	0	3	2,055	-1,549		
Bush Rim	205		103	921	13	19	2,686	+2,428		
Pacific Creek	317		29	608	0	25	1,385	+1,990		
Sands	315		2	254	63	24	686	+ 725		
White Acorn	49		3	44	0	4	144	+ 102		
Prospect Mountain	47		12	86	13	4	336	+ 140		
TOTALS	1,494		478	3,098	178	151	12,309	+4,892	68 2/	32

* Information on this table is symbolic of conditions which should be considered, but the numerical values would not necessarily be representative of the actual situation. This is due to the unpredictability of environmental factors as discussed in the Chapter 3 wildlife section. The following statement from the Wyoming Game and Fish Department (1976) concerning wildlife forage reservations in the Sandy area vividly addresses the problem:

> Data weighted or broken down by allotment or pasture would result in a cumulative error in forage allocations, as annual climatic and forage variables would create shifts in wildlife use over time and space. Accommodating the extreme ranges of variation in use, which might be observed on small land areas such as allotments over time, could result in either a greatly inflated or deflated allocation figure.

The methodology and procedures for obtaining the values in Columns 1 through 21 are explained in APPENDIX 3C.

1/ Total habitat includes custodial pastures, Federal withdrawals, and no livestock grazing area with habitat.

2/ This only covers the forage availability on crucial winter habitat during an average winter, and does not include severe winter conditions.

of the elk's arrival. The carrying capacity of the remaining 51% (115,093 acres) of the crucial habitat would be enhanced.

Treatment C (rest season long) would be applied to approximately 71,862 acres (32%) of the crucial winter habitat, using Year 1 as an example. Favorable impacts to seasonal or yearlong elk habitat would be greatest during this treatment. During periods of complete rest, vegetation and elk would be virtually undisturbed by domestic livestock. Cover and abundant food would be available for elk during the reproductive period. Wet meadows and streamside vegetation would increase in vigor and growth, becoming especially favorable for elk use throughout the year. Crucial winter habitat receiving rest under Treatment C would be enhanced through increased availability of current vegetation production of grasses, forbs, and key shrubs necessary for the survival of elk during the winter months.

Treatment E (graze until seedripe, then rest) would be applied to approximately 43,231 acres (19%) of the elk crucial winter habitat. Treatment E would benefit the crucial habitat carrying capacity because of the rest which occurs after August 15.

Cover. Cover is one of the essential factors to survival of elk. Cover provides concealment and protection from things which can do an animal harm, particularly during inclement weather and calving. Elk seek cover in: (1) more remote areas; (2) less accessible areas; (3) draws and canyons; or (4) vegetation growth which is tall and dense. The grazing systems could generally affect cover in the last two categories. Should the grazing systems sufficiently alter the availability of the basic requirements involving food, water, cover, or space, then elk would have to adapt or relocate. Areas grazed by livestock must also be usable for elk once the livestock have been removed. Existing and proposed fences included as part of the proposed grazing systems (TABLE 3-31) could have an effect on cover since they would act as barriers. Adult elk entangled in fences in the Rock Springs District are not common. Young elk, however, have had to be removed from fences (per. comm., Lockman 1976). A barrier, particularly during times of stress, could result in mortality. Elk already suffering malnutrition from adverse conditions could become weakened to the point of being unable to negotiate a fence. They could either become entangled or unable to cross the fence. They would be unable to migrate to crucial winter habitat, which would cause mortality. Older elk, having had experience with fences, could learn to negotiate them under normal conditions; however, the calves and younger animals would have less chance to successfully negotiate fences. Abnormal weather and deep, crusted snow could cause foot soreness, which could add too much stress to both young and adult animals. Impacts related to fences aiding predators and infection resulting from injury are the same as those identified for mule deer.

Migration and Space. Much of what has been said under cover also applies to space requirements and the need of elk to migrate to obtain adequate food, water, cover, and space. It is expected that changes in migration and crucial winter habitat would occur after implementing the proposal. It is felt that the grazing treatments and range improvements, primarily fences, would be most responsible for such changes (per. comm., WGFD 1976-77).

Custodial Pastures. Generally speaking, the following pastures within crucial winter habitat are probably the most important to elk: C-15, 17, 18, 19, 20, and 25. The vegetation condition of the pastures would have as much to do with their value as would fencing and the surrounding topography. TABLE 2-29 indicates that 36% of the acres (10,608) in custodial pastures are in either good or fair condition and 62% (18,273 acres) are in marginal condition. Overall impacts to elk habitat and populations would be expected to be low since custodial pastures make up less than 1% of total winter habitat and 1% of total summer habitat in the Sandy area.

No Grazing. Palmer Draw in the Gold Creek Allotment is in elk crucial winter habitat. Approximately 970 acres are proposed for exclusion from livestock use, thus reserving forage for wintering elk. The increased available forage would be beneficial to elk by permanently eliminating competition for forage between elk and livestock. Exclusion of livestock use during calving would also make the Palmer Draw area beneficial to elk (per. comm., WGFD 1977). The population would be expected to receive a boost from potential improvement of this area.

Water Development. The impacts identified for mule deer under Water Development would also apply to elk.

Fence Construction. The additional fences as proposed (TABLE 3-31) would tend to increase the death rate, especially during winter. While not quantifiable with available information, death rates would vary with severity of the winter. As snow depth increases, negotiation of fences would become more difficult for weaker animals. This problem would increase with any crusting of snow. Some animals could become entangled in fences, some diverted from the crucial habitat which is more conducive to survival, and some would be caught by predators in moments of confusion where escape routes are obstructed.

Moose

Populations. Any impacts to the moose population would likely be noticed more quickly than for any other animal in the Sandy area. Though their young are suggested to increase in weight more rapidly than any other North American big game species, they also apparently have one of the lowest fertility ratios (Wilson 1971). Moose have the smallest populations and the least summer and winter habitat of big game in the Sandy area. Under the proposed action the moose population would probably stabilize at or decrease from the current numbers (56 animals) in the short term, which is 23% below the desired long-term population (73 animals) established by the WGFD (per. comm., 1976).

Habitat.. Forage availability is the primary element which limits carrying capacity of the habitat and thus the population. The most critical time of year for this is during the winter. Dormant vegetation, snow depth, and

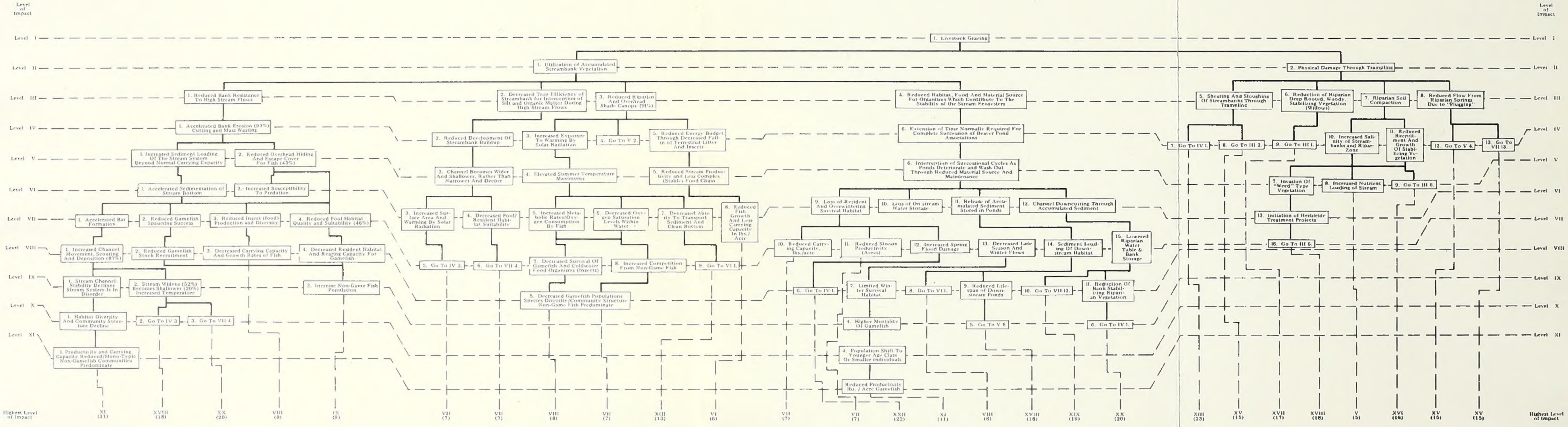


FIGURE 3D-3 Impact Analysis of the Effect of Livestock Grazing on Stream Habitat

TABLE 3-31

EXISTING AND PROPOSED FENCING
IN ELK CRUCIAL WINTER HABITAT

Allotment	Existing	Additional
Gold Creek	3	3
Little Sandy-Little Prospect	26	18
Steamboat Mountain	21	0
Red Desert	7	0
Bush Rim	7	0
Pacific Creek	20	0
Sands	8	0
White Acorn	8	0
Prospect Mountain	4	3
TOTAL	104	24

adverse weather would combine to compound the effects of prior livestock use and create situations of limited forage for the moose. Winter is the season when plant material is least nutritious and the cold weather increases body heat loss; therefore, greater amounts of food are required. The combined seasonal low forage value in plants due to dormancy, difficulty in locating available forage and inaccessibility due to snow all contribute to limiting moose winter habitat. Crucial moose winter habitat is composed of approximately 131,932 acres (7%) of the Sandy area (TABLE 3-32). There is a great deal of overlap between summer and winter habitat (MAP 2-25). Crucial winter habitat is located in all allotments except Steamboat Mountain, Red Desert, and Bush Rim. The wet meadow vegetation type is a highly important part of moose habitat (Houston 1968).

The crucial winter habitat is characterized by steep slopes which surround bottom and riparian growth. It is felt that when slopes greater than 10% are located adjacent to riparian areas livestock would congregate on the bottoms causing overuse through both the short and long terms. Increased vegetation production (TABLE 3-15) is compared with forage requirements in crucial winter habitat in TABLE 3-32 and can be expected to increase the grazing capacity of the crucial winter habitat over the long term. An average of 690 AUMs (TABLE 3-32) of forage would still be available on moose crucial winter habitat after livestock have been removed and reductions have been made as shown in TABLE 3-32 and APPENDIX 1B. Eight allotments, however, would not have adequate forage (TABLE 3-32). Herbage removed from vegetation, especially willows in the riparian areas late in the growing season, would not be replaced for winter use. An 18% reduction of available forage due to snow cover is also one of the major considerations for this analysis, as well as the activation of existing livestock nonuse.

The vegetation removed during construction of the proposed range improvements, including two-track trails, in crucial winter habitat would be insignificant since less than 30% of the 923 acres disturbed would occur within crucial habitat. Moose are thought to be the most vulnerable to habitat change of any game animal in the Sandy area. They are apparently specialized in habitat (Wilson 1971), requiring riparian areas for life's necessities for at least a portion of each year. Riparian forage is important to sustaining reproduction. Suitable forage for milk production to sustain calves can best be obtained from riparian vegetation (Patton and Judd 1970). When calves are weaned, the riparian vegetation would be critical to sustaining them.

Grazing Systems. As an example, TABLE 3-33 shows percentages of the crucial winter habitat that would receive the various treatments in Year 1. Plant diversity and high nutritional values are primary reasons that riparian areas benefit the greatest number of wildlife species of any vegetation type (per comm., Kimble 1977, Patton and Judd 1970).

Allotments in TABLE 3-34 with low ratings would have the following conditions: (1) concentrated grazing intensity that forces livestock use of undesirable as well as desirable plants in riparian areas; (2) full or partial conversion to cattle which prefer meadow type vegetation; (3) no initial rest to allow slow growing plants to regenerate additional biomass; (4) approximately the same proposed grazing intensity as presently exists; and (5) the application of Treatments A or E in the spring, which would probably stunt willow growth in pastures that were rested the preceding year (per. comm., Kimble 1977; Hormay 1970).

It is estimated that the proposed grazing systems would not benefit riparian vegetation, especially willows and aspen which are in moose crucial winter habitat (TABLE 3-35). Sufficient production and new plant establishment are required for moose. It has been estimated that 90% of the cattle and wildlife grazing use presently occurs in the riparian vegetation. All grazing animals are known to utilize willows to some degree. Pronghorn, mule deer, and elk have been observed grazing throughout the summer on stream bottoms which serve as moose crucial winter habitat. It is estimated that a combination of the above uses would reduce the capability of willows and aspen to increase their production and establish new plants, subsequently reducing their availability.

While over 50% utilization on willows is suggested to be proper use (Wilson 1971), research on willows is limited and there appears to be even less on other riparian browse responses to grazing. Hormay (per. comm., 1976), however, implies that in order to preserve riparian habitat values, sufficient rest is necessary and even habitat protection may be required. A study done near Pole Mountain, Wyoming, by Johnson (1965) indicates that willows showed improvement even without rest before implementing intensive grazing systems, but the duration of grazing was a maximum of 1½ months per year with an average of one month's grazing allowed over a four year cycle.

There are, however, five basic differences between the Pole Mountain Study and the Sandy area: (1) the intensity of use was considered light (per. comm., Call 1977) and that for the Sandy is considered moderate; (2) rainfall in the Sandy area averages between 8 and 12 inches per year (see Chapter 2 climate section) while Pole Mountain's averaged between 14 and 18 inches; (3) 75% of the proposed Sandy area would implement treatments allowing an average of 5 months' use in pastures grazed on a three-year cycle as opposed to Pole Mountain's 1½-month use in pastures grazed on a four-year cycle; (4) big game use of the Sandy area is higher compared to Pole Mountain's, which has virtually no moose use, (per. comm., Call 1977); and (5) high beaver populations nearly devastated the willows and aspen at Pole Mountain just prior to initiation of the rotation and rest-rotation grazing systems. Another rotation grazing system study involving willows occurred in the USFS Diamond Fork Allotment near Provo, Utah. Under the system, however, four years of initial rest was allowed on each pasture to allow willows and other plants adequate time to generate biomass prior to initiation of intensive grazing management. The rotation grazing management system in the Diamond Fork was designed to benefit riparian areas. Generation of biomass on slower growing

TABLE 3-32

FORAGE PRODUCTION AND FORAGE REQUIREMENTS IN CRUCIAL WINTER HABITAT AREAS*

MOOSE

Allotment	1. 1/ Total Habitat (Acres)	2. Crucial Habitat (Acres)	3. Crucial Habitat % of Total	Forage Production in AUMs: 4. Total Habitat	Forage Production in AUMs: 5. Crucial Habitat	Competitive Forage in AUMs: 6. Cattle and Horses (Wild & Domestic)	7. Sheep	8. Antelope	9. Mule Deer	10. Elk
Bar X	4,864	4,147	85	140	119	44	3	1	15	0
Fish Creek	8,150	3,482	43	665	286	17	0	0	5	0
Gold Creek	31,935	6,682	21	2,152	452	22	0	0	9	3
Little Sandy-Little Prospect	49,875	40,371	81	909	736	198	61	10	243	60
Little Colorado	17,947	12,672	71	2	1	24	31	1	1	0
Continental Peak	307	307	100	.14	.14	1	1	0	1	0
Pacific Creek	14,300	13,050	91	23	21	35	38	2	11	4
White Acorn	36,550	24,090	66	1,566	1,034	100	66	3	110	13
Prospect Mountain	61,926	13,030	21	777	163	17	10	1	13	4
Reservoir	4,730	4,605	97	15	15	3	25	1	18	0
Poston	6,776	6,424	95	14	13	9	37	1	2	0
Pine Creek	14,500	3,072	21	593	125	5	1	0	2	0
TOTALS	251,860	131,932	52	6,856.14	2,965.14	475	273	20	430	84

Allotment	12. Forage Production (AUMs)	13. Reduction for Fencing (AUMs)	14. Increase in Competitive AUMs Under Intensive Management	15. Snow Cover Reduction (AUMs)	Additional Water Developments: 16. Severe & Heavy Grazing Intensity	Additional Water Developments: 17. Extended Wildlife Occupation	18. Totals of Production (AUMs)	19. Available Forage After Reductions	% of Crucial Habitat: 20. With Adequate Forage	% of Crucial Habitat: 21. Without Adequate Forage
Bar X	46		4	21			134	- 15		
Fish Creek	12		1	51			86	+ 200		
Gold Creek	53		2	81			170	+ 282		
Little Sandy-Little Prospect	39		19	132			762	- 26		
Little Colorado	0		4	0			61	- 60		
Continental Peak	0		0	0			3	- 3		
Pacific Creek	3		5	4			102	- 81		
White Acorn	86		12	186			576	+ 458		
Prospect Mountain	138		2	29			214	- 51		
Reservoir	4		2	3			56	- 41		
Poston	5		3	2			59	- 46		
Pine Creek	21		0	23			52	+ 73		
TOTALS	407		54	532			2,275	+ 690	28 2/	72

* Information on this table is symbolic of conditions which should be considered, but the numerical values would not necessarily be representative of the actual situation. This is due to the unpredictability of environmental factors as discussed in the Chapter 3 wildlife section. The following statement from the Wyoming Game and Fish Department (1976) concerning wildlife forage reservations in the Sandy area vividly addresses the problem:

> Data weighted or broken down by allotment or pasture would result in a cumulative error in forage allocations, as annual climatic and forage variables would create shifts in wildlife use over time and space. Accommodating the extreme ranges of variation in use, which might be observed on small land areas such as allotments over time, could result in either a greatly inflated or deflated allocation figure.

The methodology and procedures for obtaining the values in Columns 1 through 21 are explained in APPENDIX 3C.

1/ Total habitat includes custodial pastures, Federal withdrawals, and no livestock grazing with habitat.

2/ This only covers the forage availability on crucial winter habitat during an average winter, and does not include severe winter conditions.

TABLE 3-33

ACRES OF MOOSE CRUCIAL WINTER HABITAT BY PROPOSED TREATMENT

Treatment	Acres	Percent of Total Crucial Habitat
A	42,740	32%
B	58,439	44%
C	25,143	19%
D	4,500	3%
E	1,110	1%
Total	131,932	99%*

* Does not equal 100% because of rounding.

TABLE 3-34

GRAZING SYSTEMS THAT WOULD BENEFIT MOOSE HABITAT

	Allotment	Pasture(s) with Crucial Winter Habitat	Treatments	System Value*
1.	Bar X	1, 2, 3	EBD	9
2.	Fish Creek	1, 2	AC	6
3.	Gold Creek	1, 2, 3, 4	EBC	15
4.	Little Sandy-Little Prospect	1, 2, 3, 4, 5	ABC-AC	10-6
5.	Little Colorado Green River Use Area	1, 2	ABC	10
6.	Continental Peak	1, 2	EBC	11
7.	Pacific Creek	1, 2, 3	EBC	11
8.	White Acorn	1, 2, 3, 5	ABC-AC	10-6
9.	Prospect Mountain	1, 2, 3	ABC	10
10.	Reservoir	1, 2	ABC	10
11.	Poston	1, 2, 3	ABC	10
12.	Pine Creek	1, 2, 3	EBC	11

*The higher rating the more complementary to moose. Treatments: A=1, B=4, C=5, D=3, E=2.

TABLE 3-35

ALLOTMENTS WITH CRUCIAL RIPARIAN HABITAT
THAT WOULD BE IMPACTED BY THE PROPOSED ACTION

Allotment	Pastures With Crucial Winter Habitat
1. Little Sandy-Little Prospect	1, 2, 3
2. Little Colorado Green River Use Area	1, 2
3. Pacific Creek	1, 2, 3
4. Reservoir	1, 2
5. Poston	2, 3

browse would usually be faster in a higher precipitation zone such as the Diamond Fork (14 inches per year) than for the Sandy area (8 inches per year). In the Diamond Fork, however, grazing intensity was initially reduced by 70% because this was believed to be necessary to accommodate the existing carrying capacity and proper use in the riparian areas. Dorn (1977) writes, "Forage competition caused by trampling and rubbing could become significant with heavier cattle stocking"

Although the Sandy area is not presently overstocked, especially in view of the amount of permitted nonuse, this amount of nonuse would not be continued under the proposal. Use of riparian areas by cattle would increase due to full or partial conversion from sheep to cattle. Moose which depend on the riparian areas would further increase pressure on the vegetation in these areas, particularly willows. In contrast there were very few, if any, moose using the Diamond Fork study area. Moose in the Sandy area probably mostly depend on willows according to diet studies. Crucial habitat (riparian browse) of the pastures shown in TABLE 3-35 having steep slopes would be adversely impacted by the proposal. Deterioration of the riparian browse and diversity in the above pastures would affect 50% of the moose crucial winter habitat. Approximately 95% (125,335 acres) of moose crucial winter habitat would be managed with a sequence of treatments which are probably uncomplementary to the growth style of willows and likely to be most detrimental to the portions of crucial winter habitat occurring in the pastures outlined in TABLE 3-35.

All grazing systems would probably increase the cover of grasses and forbs. Occupation and intensive use of meadows by livestock during Treatments A and B (graze season long and rest until seedripe, then graze) would be detrimental to the riparian browse. Cattle would damage willows by horning, scraping, and scratching as well as browsing (Dorn 1970). The systems with the least amount of early use per cycle, least duration of use per cycle, and the most rest over a cycle would complement plants likely to compose the bulk of moose diet.

Moose crucial winter habitat in Pastures 1 and 2 of the Fish Creek Allotment and Pasture 5 of the White Acorn Allotment would receive the most damage from livestock grazing because no season-long rest would be provided. Use would be alternated between the two pastures each year. These pastures contain approximately 5% (6,551 acres) of the moose crucial winter habitat. Willows and other riparian browse in these areas are presently in good condition. The Fish Creek two-pasture deferred system would be the least beneficial to moose crucial habitat. TABLE 3-36 shows the percent of crucial winter habitat that would be adversely impacted by the grazing systems. Existing damage to willows would occur in an estimated 10% (13,932 acres) of the crucial winter habitat.

Cover. Cover in moose habitat primarily includes aspen stands on the slopes and meadows with willow bottoms.

Water. The proposed water developments should successfully distribute cattle within a pasture, thereby relieving pressure on the riparian areas. The vegetation along riparian areas would, however, become more desirable to livestock during late summer as upland vegetation dries up. Shade is also provided cattle in riparian areas, which encourages grazing use. Better distribution combined with rest in the systems should cause increased vegetation production in the meadow types (vegetation section). The development of one spring each in the Prospect Mountain, Poston, and Pine Creek Allotments would be located within moose crucial habitat. Cattle grazing around these locations would be expected to reduce the carrying capacity of the moose habitat. The season-long rest (Treatment C) provided in the grazing systems, particularly the four-pasture alternately grazed system (Gold Creek), should complement the riparian areas by at least increasing vegetal cover but not willow browse.

Migration and Space. Moose seasonally change locations in the Sandy area, and MAP 2-25 illustrates the relationship between summer and winter habitat for moose in the Sandy area. Moose at times must move out of the riparian areas along streams, although they apparently prefer to stay within a few miles of these areas. This characteristic limits their summer habitat.

Custodial Pastures. Generally, the management of custodial pastures is liable to be detrimental to the welfare of moose. Moose are now probably utilizing those areas along streams at or near carrying capacity. Pastures C-5, 7, 11, 17, 18, 20, 24, 25, 31, 32, and 33 are within the crucial habitat. The larger pastures, particularly C-24 and 25, are more valuable to moose than smaller ones. It is assumed that most of these pastures would receive season-long grazing. Therefore, the riparian areas of these pastures are probably of less value than those utilized by the proposed management systems.

No Grazing. It is anticipated that moose would benefit from available forage in this area and that the population would continue to increase because there would be no livestock to compete for available forage. Riparian browse would be expected to be maintained (TABLE 3-15).

Water Development. Additional waters may distribute cattle away from riparian areas. However, it is believed that the effectiveness of these additional waters may not be very significant because of the following: (1) the close distance between existing waters and the riparian areas; (2) the attractiveness of the green riparian areas during the summer; (3) conversions or partial conversions to cattle which prefer the wet meadow vegetation; (4) the steep terrain located adjacent to riparian areas and the cattle's tendency to remain in the bottoms; (5) concentration of all the livestock into one-half to one-third of an allotment; and (6) limited reduction of grazing intensity.

Fence Construction. As snow depth increases, negotiation of fences would become more difficult for moose. Crusted snow would increase this problem. Existing and proposed fences in crucial winter habitat would pose the greater problem (TABLE 3-37).

Once the proposed fences are constructed, there would be nearly 143 miles of fencing in moose habitat. Approximately 47 miles (about 33%) of these fences would be located in crucial winter areas and some mor-

TABLE 3-36

PERCENT OF MOOSE CRUCIAL WINTER HABITAT
THAT WOULD BE ADVERSELY IMPACTED BY PROPOSED GRAZING SYSTEMS

System*	Treatment Sequence	Allotment(s)	Approximate % of Crucial Winter Habitat
1. Three-Pasture Rest-Rotation	ABC	Little Sandy-Little Prospect Little Colorado White Acorn Prospect Mountain Reservoir Poston	80
2. Three-Pasture Rest-Rotation	EBC	Continental Peak Pacific Creek Pine Creek	10
3. Four-Pasture Alternately Grazed	EBCC	Gold Creek	10
4. Three-Pasture Deferred	EBD	Bar X	5
5. Two-Pasture Alternately Grazed	AC	Fish Creek Little Sandy-Little Prospect White Acorn	5

*The systems are ranked with the most detrimental systems having the highest number classification. The impact of each system was determined by the length of rest, duration of use, and length of cycle (TABLE 3-32 and Chapter 1).

TABLE 3-37

EXISTING AND PROPOSED FENCING IN
MOOSE CRUCIAL WINTER HABITAT

Allotment	Pasture	Miles of Fence Existing	Miles of Fence Proposed Additional
1. Bar X	1	5	2
	2	2	
	3	2	
2. Fish Creek	1	8	
3. Gold Creek	1	3	
	2		2
	3	1	
4. Little Sandy-Little Prospect	1	5	7
	2	12	
	3	8	7
5. Little Colorado	1	6	1
	3	4	3
6. Pacific Creek	3		3
7. White Acorn	1	1	4
	2		7
	3	6	
	5	4	
8. Prospect Mountain	2		3
	3	6	
9. Reservoir	1	2	
	2		1
10. Poston	1		6
	2	12	
11. Pine Creek	1	1	
	3	9	
	TOTAL	97	46

tality is anticipated. The mortality rate cannot be quantified at this time because of a lack of data, and an estimate would be related to the severity of the winter.

Sage Grouse

Population. Potential detrimental impacts could outweigh positive ones due to competition for food and space in riparian areas and potential trampling in breeding complexes. The apparent tendency for both short and long term could be a reduction of the sage grouse numbers in the Sandy area although the amount is unknown since populations are unknown. Two important seasonal conditions were considered in making the analysis for sage grouse: (1) the winter habitat is critical to individual survival and (2) the breeding complexes are critical to maintaining this species which has a high population turnover. The suspected order of importance for critical elements would be: space, cover, food, and water. The breeding complexes would be the most important space to sage grouse considering the various elements of the proposal (conversion to cattle, additional waters, grazing systems, and fences). The treatments allowing early livestock grazing would probably be most detrimental. Early use would occur with Treatments A (graze season long) and E (graze early), one of which occurs in the grazing system of every allotment. When cattle enter a pasture May 1, sage grouse are still incubating eggs (per. comm., Higby 1974) as hens select nests in April. Those nests located within one-quarter mile of streams and water developments could be trampled due to cattle preferring these areas.

Habitat. Sage grouse occupy the entire Sandy area with their density being higher around the breeding complexes (MAP 2-26). The most beneficial treatment would be C, which is rest season long and would tend to offset potential detrimental effects from Treatments A or E. The system with the most rest per cycle, or the four-pasture alternately grazed system of the Gold Creek Allotment, would probably be best for sage grouse. The most rest, shortest duration of use, and least summer use per cycle would result in the least competition with cattle for space, cover, and food; reduce trampling; and enhance the development of young grouse. The order of benefit from best to worst in terms of crucial winter habitat and breeding complexes is indicated in TABLE 3-38.

The vegetation removed during construction of the proposed range improvements, including two-track trails, in crucial winter habitat would be insignificant since less than 50% of the 923 acres disturbed would occur within the crucial habitat.

Food. Both short- and long-term benefits could occur to the sage grouse crucial winter habitat because cattle use of sagebrush would be less than that occurring with sheep. Positive benefits could, however, be outweighed by detrimental impacts, such as trampling during the breeding season, thus reducing the survival of the young chicks. Conversion to cattle and resulting competition for food in riparian areas is also important in pastures where Treatments E and A are utilized since these are sage grouse nesting areas.

Cover. Components of the proposed action would probably affect cover most during early season use (Treatments A and E). Livestock may concentrate along riparian areas, and this could increase trampling of nests along standing and flowing waters (approximately 1,900 to 2,000 acres), wet meadows, and springs.

Grazing Systems. Proposed grazing systems utilizing Treatments A and E would probably not provide production of optimum sage grouse habitat. Vegetation associated with meadows and drainage ways are needed as part of the sage grouse habitat and would invariably be utilized by livestock under any of the proposed grazing systems. It is anticipated that riparian habitat important to sage grouse would improve gradually under improved grazing management which utilizes season-long rest or rest during half the grazing season as a means to allow the vegetation to recover.

Although additional waters are proposed, cattle could damage the cover in close proximity (300 feet) to water, and the concentration of livestock would raise the risk of trampling for young chicks. Treatment C would tend to offset potential detrimental effects by season long rest.

Water. The impact would primarily be from conversion to cattle. The major impact would be occupation and competition for space between cattle and young grouse in riparian areas. Riparian growth around reservoirs would only benefit sage grouse in six pastures within crucial habitat, since only six of the proposed 96 reservoirs would be fenced. The other 90 reservoirs would not be fenced and would have limited riparian growth. Therefore, they would be of little benefit to sage grouse, especially in the short term. During rest as some riparian growth becomes established, some reservoirs would provide a minimal riparian area. Virtually no benefit would be derived from the wells since the stock tanks would be located too high off the ground to permit use by sage grouse (per. comm., June 1977). Reservoirs located in pastures receiving Treatment C would provide whatever vegetation may become established during the time rest is provided.

Migration and Space. During winter, sage grouse are believed to flock together in various locations in the Sandy area depending on weather conditions. By the first of December, a thorough mixing of age and sex segments would be expected. It is believed males would start to move to strutting grounds as early as January, leaving flocks preponderantly composed of females and young males. Within six weeks all males would be expected to be in or near the strutting grounds. The females would probably arrive at the strutting grounds throughout March, and breeding could be complete by April. Seasonal movements or migrations are accomplished to achieve conditions which satisfy life cycle requirements. The vegetation aspect, exposure, topograpy, height of vegetation, vegetal composition, weather, and requirements of space with ramifications involving territoriality all contribute to the need to migrate. Sage grouse hens undoubtedly choose areas that pose the least danger to their young. However, since nests are estab-

TABLE 3-38

PROPOSED GRAZING SYSTEMS AND TREATMENTS ON SAGE GROUSE CRUCIAL WINTER HABITAT

Order of Benefit	Grazing System	Treatments Applied	Allotment[1/]	Acres in Crucial Habitat [2/]	% of Total Crucial Habitat
1	Alternately Grazed, 4-Pasture	EBCC	Gold Creek	None	-
2	Rest-Rotation 3-Pasture	EBC	Red Desert, Bush Rim, Continental Peak, Pacific Creek, and Pine Creek	367,668	32%
3	Rest-Rotation 3-Pasture	ABC	Parts of Little Sandy-Little Prospect; Little Colorado, Sands, White Acorn, Prospect Mountain, Reservoir, and Poston	790,142	68%
4	Deferred 3-Pasture	EBD	Bar X	None	-
5	Deferred 2-Pasture	EB	Steamboat Mountain	1,280	Less than 1%
6	Alternately Grazed, 2-Pasture	AC	Fish Creek; Parts of Little Sandy-Little Prospect; and parts of White Acorn; and parts of Prospect Mountain	None	-
	TOTAL			1,159,090	100%

1/ See APPENDIX 1A.

2/ See TABLE 2-50.

lished before livestock grazing begins, hens with nests located in riparian areas would not be able to avoid locations where cattle would congregate; consequently, nests could be destroyed and the hens driven off. Rest under Treatment C would benefit brooding in certain years by eliminating livestock use in those pastures where the treatment is applied, offsetting some of the potential detrimental effects of other treatments in all the grazing systems.

Custodial Pastures. Summer habitat is provided in all custodial pastures in the Sandy area. Those pastures containing winter range and/or breeding complexes are shown on MAP 2-26. BLM field observations in 1976 (see vegetation section) have indicated that pastures in static or declining vegetative trend contain sage grouse habitat. Most of these pastures also contain deteriorating wet meadow areas which are important to sage grouse during reproductive activities. This condition is assumed to be due to continuous grazing during the same season on an annual basis. Nine out of the thirteen pastures (1, 2, 5, 14, 17, 18, 20, 22, 24, 25, 28, 32, and 33) contain approximately 29%, or 8,614 acres of the total acres (APPENDIX 1C) of the total crucial winter habitat and receive early spring and/or season-long livestock use. The long-term impact of establishing these pastures as custodial management areas could be deterioration of the vegetation with eventual loss of habitat, particularly wet meadow riparian areas.

Water Development. Sage grouse are capable of living for many days without water. However, good habitat is generally associated with water, particularly during the summer when the hens have broods. The development of livestock water in sage grouse winter habitat or breeding complex areas could intensify livestock use, causing an increased removal of sage grouse forage and cover.

Waterfowl

Population. The populations would be expected to decrease in the Sandy area on a short-term basis. This would occur as a result of conversion from sheep to cattle, since cattle prefer riparian areas and could increase trampling losses. Duck numbers could increase back to present average levels over the long term as a result of anticipated increases in the amount of cover. The most critical time period would be from May through June as nesting and brooding occurs. The treatments which allow spring grazing would be expected to be most detrimental. Treatments A (graze season long) and E (early grazing) would allow grazing during this period, thus conflicting with waterfowl reproduction by increasing the danger of trampling.

Waterfowl would be directly impacted by spring grazing, while the impacts of late summer and fall grazing would not be realized until the following year. These would be due to lowered amounts of residual cover (Mundinger 1975).

Habitat.

Water. The proposed reservoirs would be expected to benefit ducks and tend to increase populations. There would be many other ecological factors involved in the ultimate increase or decrease of numbers in the Sandy area. Ducks would probably make use of the proposed water developments when they become available. Ducks would also make better use of available water where there is more cover available (per. comm., Serdiuk 1977).

Some of the proposed earthfill reservoirs could enhance duck populations. The size, location, type of drainage, and cover are important in making a good habitat for ducks. Generally pit reservoirs would not offer the potential for duck use that is possible with earthfill reservoirs. The latter would probably have a larger apron and drainage system with potential for a larger area of water. Also, they usually retain water longer. The production potential of various reservoirs to ducks would vary depending on grazing treatment applied, number of livestock, and weather conditions. A dry year or a series of dry years could render most of the reservoirs useless to ducks.

Food. As a result of the proposed grazing systems rotating use on the forage, watershed stability is expected to increase over the long term. The vegetal cover in riparian areas (wet meadows) along perennial streams is expected to increase (TABLE 3-15). These two factors should decrease sedimentation. This decrease would probably encourage the diversity of aquatic fauna, primarily by decreasing mechanical interference with respiration/metabolism, allowing more light penetration, and by lowering the chemical oxygen demand (Meyers 1966). The greater aquatic diversity would probably enhance feeding opportunities for ducks.

Breeding habitat is provided in or near riparian areas associated with streams, wet meadows, and stock ponds. It has been demonstrated that grazing by cattle reduces nesting cover of upland vegetation around stock ponds (Bue et al. 1952). Furthermore, the quality of shoreline cover decreased with increased grazing intensity, and use by breeding pairs and broods is reduced on waters with poor shoreline cover. Kirsch (1969) found higher nest densities and nest success on ungrazed, as compared to grazed, plots.

Heavy cover, such as in fenced riparian areas, appears to be attractive to nesting waterfowl and nest predators as well (Keith 1961). The presence of residual cover, however, apparently contributes to increases in waterfowl production, particularly for early nesting species such as mallard and pintail (Gjersing 1975, Keith 1961).

The amount of destruction of nests through livestock trampling is unknown. Interpretation of limited data prepared by Gjersing and Mundinger (1975) suggests that as high as 30% of duck nests could be lost through trampling.

In the Sandy area, Treatment A would be utilized on 400,335 acres (20%) during the first year and 449,870 acres (23%) during the 6th year following implementation of the proposed action (TABLE 1-9). As a result, an estimated 1,200 to 1,300 acres of waterfowl habitat and an average of 2,280 to 2,500 pairs of ducks could be adversely impacted during the short-term (TABLE 2-51).

Cover. It is believed the cover availability in riparian areas (standing and flowing water—1,900 to 2,000 acres),

wet meadows, and springs which could be used for reproduction is being fully used to the limit (per comm., Serdiuk 1977).

An estimated 1,200 acres of water and associated riparian habitat could be reduced in quality as nest and brook habitat for a period of at least one year following implementation of proposed action.

Grazing Systems. Those described in Chapter 1 which would permit the accumulation of residual vegetation would benefit waterfowl over the long term. Observations in Montana suggest that the attractiveness of a pasture or allotment increases for waterfowl as the grazing intensity and period of use decreases during the previous grazing season (Mundinger 1975). In the Sandy area grazing systems which allow season long or spring grazing (Treatments A and E) would present the greatest limit to sustained waterfowl production.

The impacts to waterfowl and their habitat through Treatment E (early grazing) are similar to Treatment A (season-long grazing). Between 238,395 acres and 261,235 acres (12% to 13% of Sandy area) would receive Treatment E over the first six-year grazing cycle (TABLE 1-9). This would include an estimated 700 acres of waterfowl habitat contained within these areas. Short-term reduction of habitat quality could affect the reproductive success of over 1,300 pairs of ducks (TABLE 2-51). Improved range condition eventually resulting from periodic rest or deferment could have the positive impact of reducing deterioration of riparian vegetation on the long term.

Migration and Space. Migration is the process of changing locations required to achieve conditions ideal to carry on life's functions. Space is an ecological factor which plays a role in the compatibility of a desirable location. Anticipated drawbacks resulting from conversion from sheep to cattle and resultant cattle concentrations along riparian areas would cause competition for space between nesting ducks and cattle. Some relief to the riparian areas could occur where existing waters are well separated such as in the Red Desert and Little Colorado Allotments. The grazing system of these allotments would concentrate livestock into one or two pastures, allowing rest on the third pasture. All existing riparian areas are expected to receive extreme use, endangering the nests of early ducks and reducing the compatibility of areas for nesting. A general decrease in the desirability of the Sandy area for reproduction would be likely during the short term. Population should again stabilize at the current levels as a result of increases in riparian vegetation and increased nesting succession which is probable in rested pastures.

Custodial Pastures. Duck populations in the Sandy area would be expected to remain unchanged as a result of continued custodial management of these pastures. Short-term impacts are similar to those previously described under grazing systems. Long-term adverse impacts are intensified since proposed use continues year after year with no rest or deferment to provide for periodic recovery or maintenance of breeding and nesting habitat. TABLE 1-12 indicates that 23 of 33 custodial pastures (70%) would be used during the spring and/or for season-long livestock grazing. Residual vegetation in association with wet meadows and stream and reservoir shorelines cannot be anticipated. Breeding success is restricted on pastures receiving continuous grazing (Mundinger 1975).

No Grazing. Since the no grazing area borders the Sweetwater River and livestock would be excluded from it, the area would be good habitat benefiting ducks although the size of the area would not provide sufficient habitat to increase populations significantly.

Water Development. Nesting use and reproductive success around three proposed earthfill reservoirs with fencing could be significant. The fences would promote vegetation growth around those areas by eliminating livestock trampling and grazing. This would serve to raise average numbers of nesting pairs and young in these locations. This could be significant and would serve to partially offset detrimental effects from trampling of nests by cattle in areas of concentrated use along unprotected riparian habitat. Three pit reservoirs, which would also be fenced, would provide the same value.

Nongame Species

Populations. Average numbers for all nongame species (including white-tailed prairie dogs) would be expected, in general, to decrease in the short term but should increase above the existing population level over the long term. The variety of nongame animals in the Sandy area is too great to permit detailed discussions of impacts which could result from the proposed action. TABLE 2-34 identifies representative species grouped according to important habitat requirements. Species in each group would be similarly affected by the various component of the proposed action (grazing systems, range improvements, etc.). These species groups are used to illustrate differences in impacts due to differences in wildlife forms and to suggest trends in habitat values which might occur over the long term. Groups I, II, III, and IV would be most subject to impact.

Habitat. Anticipated impacts over the long term would not be expected to involve creation of new habitat or direct habitat loss but rather a gradual improvement of present range condition which would affect habitat and species diversity. In addition, many nongame species exhibit cyclic changes in the population, not necessarily in direct relation to the amount and quality of their habitat.

The primary limiting factors for the majority of nongame animals in the Sandy area are winter conditions, food availability, space, and territorial requirements. Restrictions of any of these could cause population declines. There are three basic factors affecting species in the Sandy area: (1) species such as raptors can tolerate very little interference during the breeding season; (2) species such as white-tailed prairie dogs and jackrabbits require limited population densities to avoid disease and pestilence; and (3) animals such as the badger appear to limit their known density within the concept termed "territorial behavior"(Welty 1959).

During the short term and long term, the grazing systems would allow for regeneration of vegetation and provide greater amounts of forage. Although competition for space by nongame wildlife in riparian areas would be high, the additional production over the long term could increase the carrying capacity and allow greater density tolerances by species.

Another concern is the anticipated increased risk from trampling caused by concentration of livestock into the smaller pastures. Trampling would probably be most prevalent near waters, where cattle concentrate and the diversity of nongame species is usually highest.

The eggs of many birds would be trampled by livestock during Treatments A and E. Some nests of ground nesting birds such as horned larks, killdeer, vesper sparrows, and mourning doves would run a higher risk of being destroyed both in the short and long terms.

Food. Initial removal of vegetation in meadow areas from livestock grazing and trampling is expected to be higher than would be conducive to good habitat conditions for some rodents, rabbits, reptiles, amphibians, insects, etc. Consequently, predators such as weasels, skunks, badger, mink, and raptors could have lower hunting success. Following season-long rest during Treatment C, which is in most proposed systems, this impact should be eliminated as increases of vegetal cover are expected, at least in the long term.

Cover. Prairie dog colonies mainly occur in the sagebrush-grass vegetation type which provides good cover (Chihuahuan Desert Research Institute 1976). This type covers over 76% (1,531,475 acres) of the Sandy area (TABLE 2-14). In Colorado, white-tailed prairie dogs mainly occur in saltbush vegetation, a desert shrub type which also occurs in Wyoming and comprises nearly 10% of the Sandy area, or approximately 190,470 acres.

Should poor conditions develop which are adverse to survival, a species must either adapt, move, or die. The smaller, flightless nongame species are not as mobile as larger animals and generally confine their activities to a small area. If they were forced to move, they could fall prey to predators when they leave cover attempting to locate in an area with better conditions.

Initial implementation of the grazing systems would allow trampling and disturbance of eggs, young, and maternal females in pastures using Treatment A (graze season long) and E (graze early). The acreage which would be involved in a yearly basis is shown in TABLE 1-9. All of the allotments provide early use on from one-third to one-half the allotment area. Long-term anticipated vegetation production increases shown in TABLE 3-15 would provide additional cover, reducing detrimental impacts and stabilizing population levels.

Water. The proposed water developments would likely cause shifts in population densities within the affected pastures. Those animals whose habitat would be inundated would have either to relocate or die. Small game numbers and diversity may increase around the additional waters.

Construction of one water development on the western edge of Pasture 1 of the Little Sandy-Little Prospect Allotment and one in the northern portion of Pasture 3 of the Reservoir Allotment (MAP 1-5, located in the pocket attached to the back cover) would destroy and inundate known white-tailed prairie dog habitat, causing them either to relocate or die. The waters would be located in pastures where apparently reliable ferret sightings in recent years have been made. Since ferrets prey primarily on prairie dogs, loss of the prairie dogs could have an direct effect on the ferrets. Since the total acres of vegetation disturbed is less than 1% (923 acres) of the Sandy area, it is felt there would be no significant impact to the nongame species habitat.

Migration and Space. Mortality could occur in the short term as a result of initial forage removal prior to winter, particularly in pastures having Treatment A (season-long grazing). There are actually a number of diversified behavior patterns among different nongame species. However, as written under the analysis of cover, many nongame species are restricted by a lack of mobility and some, like the white-tailed prairie dog, remain below ground for the winter. A lack of fall or winter forage could force some nongame animals to migrate to areas with better food and cover.

Custodial Pastures. No significant change in nongame species habitat and populations in custodial pastures would be expected over the long term since livestock use will remain essentially the same under the proposal.

No Grazing. The proposed no grazing area would allow continuous, unhampered use by nongame species. This and the expected additional cover would allow population increases.

Threatened and Endangered Species

Two species which are classified as "endangered"are known to occur in the Sandy area. Potential impacts which could result from the proposed action are not well understood. Formal consultation under Section 7 of the Endangered Species Act of 1973 has been initiated with the U.S. Fish and Wildlife Service.

Peregrine Falcons.

Populations. The proposed action could cause some minor population reductions in the Sandy area in the short term, but long-term impacts would generally be beneficial and lead to increases in peregrine numbers. Breeding space and disturbance during breeding would be the limiting factors to the population in the Sandy area.

A preferred nesting habitat component in the Sandy area is along cliffs, slopes, river cutbanks, mounds, and occasionally high sand dunes. Examples of areas which seem most likely to provide nesting habitat include the Oregon Buttes, cliffs along the Green River, cliffs and the general vicinity along the Green River, cliffs and the general vicinity along the Sweetwater River, and the Steamboat Mountain area. A single human visit to the vicinity of the nest site may cause desertion of the nest site, particularly when occurring early in the nesting cycle (Smith and Murphy 1973; Powers, et al. 1975).

Habitat. Peregrine also prefer areas of considerable free water (Snow 1972a) which would be characterized

by riparian vegetation. Cattle tend to congregate along streams, increasing the potential for man to come into contact with the falcons as livestock are moved out of one pasture and into another. This activity could disturb nesting falcons; however, their nests are generally in inaccessible areas.

Food. The long-term anticipated increases in vegetation production would benefit potential prey species, therefore benefiting the peregrine food base.

Cover. Conversion from sheep to cattle and resulting increased utilization of riparian cover would expose prey, temporarily benefiting peregrine. In the long term, prey diversity and populations would likely increase because of increases in vegetation production (TABLE 3-15) and cover (TABLE 3-14).

Water. Use of the existing waters by cattle has the potential of disturbing breeding habitat and nests. Fencing of existing waters is expected to enhance potential prey populations benefiting peregrine.

Migration and Space. Some peregrines may reside yearlong, and some may use the Sandy area for reproduction and then migrate out of the area for the winter. Livestock conversions would limit space in riparian areas due to competition with cattle. The riparian areas would be expected to have the greatest animal density and diversity per unit area of any vegetation type. Any decrease in riparian habitat would adversely influence potential peregrine use.

Range Improvements. Construction of fences or water developments near nesting peregrine falcons may eliminate or greatly reduce nesting success of this species. Maintenance and human activities at wells could also cause enough disturbance to result in nest abandonment.

Black-Footed Ferrets.

Populations. Not enough is known about the ferrets to indicate changes in population due to the proposed action. It is anticipated, however, that anything that would reduce the ferrets' food source would reduce ferret populations.

Habitat and Food. An important element for the ferrets would be food availability. They depend to a large extent on white-tailed prairie dogs as a food source and have also been known to prey on other members of the squirrel family (Sciuridae) as well as insects. Winter would be a critical time for survival so winter food availability may be the most important factor for determining success or failure in individual survival.

Cover. Concentrated livestock use around water developments, especially in the Little Sandy-Little Prospect and Reservoir Allotments near prairie dog towns, could destroy vegetal cover through trampling, causing the prairie dogs to relocate. Improved cover in the long term would be expected from anticipated increases in vegetation production, which would likely enhance prey species and could benefit the ferret.

Water. In the short term, construction of proposed water developments could cause adverse effects to the prey species of the ferret. Construction of two water developments which would flood prairie dog towns in areas of black-footed ferret sightings in the Little Sandy-Little Prospect and Reservoir Allotments (see water portion of nongame species) could result in a direct loss of ferret prey and possible loss of any ferrets depending on the prairie dogs for food. This interpretation is supported by investigative work of the Chihuahuan Desert Research Institute (1976) and Clark (1975).

Summary of Impacts to Terrestrial Wildlife

Short-term effects and impacts that would be expected to occur with implementation of the proposed action are as follows.

There would be intensive use around stream bottoms, standing waters (1,900 to 2,000 acres), wet meadows, and springs from increased cattle use. This would make these areas less suitable for bird nesting and brooding and generally less desirable for all riparian habitat users. The impacts from intensive spring use (season-long use in Treatment A and early season grazing in Treatment E) would be increased disturbance and/or abandonment of nests on the ground and in shrubs, less suitable areas for sage grouse brooding, and poorer quality cover and food for those species primarily associated with riparian habitat.

There would be increased utilization of forage by livestock on key big game crucial winter habitat in allotments when Treatments A, B, and D are applied. TABLE 1-9 shows the Year 1 occurrence is on 400,335, 651,950, and 2,230 acres, respectively. This could result in some big game winter mortality, especially of young animals, some malnutrition of adults and subsequent effects on reproduction, and some short-term overuse of shrub species in the pastures receiving the treatments.

Treatments A and B would allow late season forage and cover removal on approximately two-thirds of an allotment during a given year. Winter forage is particularly valuable for winter survival of all wildlife in the Sandy area. Concentrated late season grazing prior to a severe winter could result in heavy wildlife losses. Benefits from season-long rest (Treatment C) and late season rest (Treatment E), when combined with early season rest in Treatment B, may compensate for some of the detrimental effects of grazing from Treatments A and B.

There would be intensive, short-term spring use of maturing plant species during Treatments A and E. Heavy use (Treatments A and B) followed by season-long rest (Treatment C) would permit development of increased plant vigor and growth, providing better food and cover for the wildlife during the fall and winter following rest.

There would be about 923 acres of wildlife and small animal habitat which would be disturbed with construction of proposed range improvement projects. The proposed 265 miles of three-strand barbed wire fence is not anticipated to create significant migration barriers to big game animals during the spring, summer, or fall on their habitat. However, the 271 miles of four-strand barbed wire fences could cause minor impacts to big game on summer habitat. During winter migration to crucial habitat, fences would restrict wildlife movement, especially when deep, crusted snow is present. TABLE 3-39 shows by allotment those fences in crucial habitat that would contribute to mortality of all big game species.

TABLE 3-39

SUMMARY OF MILES OF FENCE IN BIG GAME CRUCIAL WINTER HABITAT BY ALLOTMENT THAT WOULD RESTRICT MOVEMENT AND CONTRIBUTE TO MORTALITY UNDER PROPOSED ACTION

	Pronghorn Antelope		Mule Deer		Elk		Moose	
Allotment	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1. Bar X	None		None		None		9	2
2. Fish Creek	None		None		None		8	0
3. Gold Creek	None		None		3	3	4	2
4. Little Sandy - Little Prospect	21	4	19	44	26	18	25	14
5. Steamboat Mountain	None		0	9	21	0	None	
6. Little Colorado	42	16	None		None		10	4
7. Red Desert	None		None		7	0	None	
8. Bush Rim	None		None		7	0	None	
9. Continental Peak	None		None		None		None	
10. Pacific Creek	11	12	0	7	20	0	0	3
11. Sands	9	11	0	16	8	0	None	
12. White Acorn	None		None		8	0	11	11
13. Prospect Mountain	None		17	32	4	3	6	3
14. Reservoir	17	3	None		None		2	1
15. Poston	None		None		None		12	6
16. Pine Creek	None		None		None		10	0
Total	100	46	36	108	104	24	97	46

Long-term effects and impacts which would be expected from the proposed action would vary. There would be a gradual increase in quantity and quality of vegetation throughout the area. This would result in general improvement in the health of wildlife species, including some increases in big game populations. TABLE 3-40 summarizes by species the forage production and forage requirements, percent utilization by livestock of forage produced on crucial winter habitat, and the reduced availability of forage due to snow cover.

Since key species for the proposed grazing systems on all but one allotment are grass species, shrub density, especially for willows, may not be enhanced since seedripe of grasses is earlier than that of shrubs. Grazing by livestock would take place on less phenologically mature browse species which have not yet produced seed (vegetation section). A decrease in density and/or composition of shrubs would therefore be anticipated in approximately 50% of the Sandy area.

Estimated changes that would occur to existing big game habitat forage quality conditions in the Sandy area are shown in TABLE 3-41. Due to anticipated livestock use of riparian habitat, it is anticipated that moose habitat and moose populations could only be maintained at the present level (56 animals), which is 23% below the desired level. Proposed grazing systems should benefit elk habitat. Populations are presently at the desired level (1,165 animals) and are not anticipated to change. Deer populations would remain as much as 10% (6,600 animals) under desired population levels established by the Wyoming Game and Fish Department. Pronghorn populations would be anticipated to be maintained at about the current population level (9,400 animals). The possibility exists that up to 62% of the pronghorn populations could be lost as a result of a severe winter coupled with the proposed fencing (TABLE 3-26).

Proposed grazing systems utilizing Treatments A and E would not fully provide the optimum sage grouse or waterfowl habitat because of nest disturbance and trampling in riparian areas. The grazing systems, however, would increase vegetation production, thus improving habitat and cover, gradually contributing to population increases over the long term.

Six of the proposed reservoir developments would complement sage grouse summer habitat, and three would provide additional waterfowl breeding habitat. However, additional benefits to sage grouse and waterfowl could be gained by 22 miles of fences around existing waters.

Impacts to nongame species are expected to increase populations in the long term.

Custodial pastures in the Sandy area are not anticipated to impact or change either crucial habitat or wildlife populations.

Excluding the 970-acre Palmer Draw area from livestock grazing would result in a positive impact for many wildlife species. They would not have to compete with livestock for forage.

The black-footed ferret is suspected to occur and the peregrine falcon is found in the Sandy area. Both of these are endangered species. Removal of prey (especially white-tailed prairie dogs) could strongly impact ferrets where they occur. Proposed construction of livestock management projects near nesting peregrine falcons could affect reproductive success.

Aquatic

It is questionable whether the proposed livestock grazing would be compatible with attaining the aquatic management objectives as described in TABLE 1-8. Grazing systems are basically designed around the requirements of an entire allotment, 99% of which is upland habitat. Because they are designed to have one season's growth of vegetation available at the onset of each grazing period, the grazing systems do not fully take into consideration the requirements of or management for aquatic habitat.

Aquatic habitat quality is directly dependent upon physical bank or shoreline stabilization and protection by riparian vegetation. Koenings (1976) has noted:

"We must also develop grazing management programs that are sensitive to riparian habitat values. Riparian habitat is one of the most productive and most valuable types of habitat on national resource lands. Studies have shown that riparian habitat of permanent and intermittent waterways maintains the greatest wildlife diversity and abundance of birds, mammals, reptiles and amphibians in the arid west.

"This habitat type is also the most scarce within most of the arid west as reflected by a BLM survey carried out in Utah. This study revealed that only 22,000 acres out of a total 21 million acres were riparian. In addition to being scarce, this habitat type is also extremely sensitive and susceptible to excessive grazing pressures. Thus, through improved grazing management systems and well-conceived watershed programs, we have the tools at hand to benefit riparian and other important wildlife habitat"

In order to "benefit riparian and other important wildlife habitat", the improved grazing management systems proposed must be designed to manage for and be sensitive to the riparian conditions required for maintenance of aquatic habitat.

Personal conversations with Hormay (1976) have indicated that two key factors in any rest-rotation grazing system are the amount of rest provided to compensate for the intensity of use received and the fact that vegetation along aquatic habitat areas is "invariably closely utilized under any stocking rate or system of grazing" The ramifications of increased intensity of use and physical damage per unit area during the grazing period would be 66% greater in three-pasture rest-rotation systems and 100% greater in the two-pasture alternately grazed systems. Combined with major conversions from sheep to cattle, anticipated long-term increases in livestock use, and grazing systems designed around upland key vegetative species, it is doubtful whether the systems proposed fully consider or are sensitive to the requirements of aquatic habitat. This is especially true in consideration of existing habitat conditions under present levels of use

TABLE 3-40

SUMMARY OF FORAGE SUFFICIENCY IN CRUCIAL WINTER HABITAT FOR BIG GAME SPECIES

Allotment	Pronghorn Antelope	Mule Deer	Elk	Moose
	Forage Sufficiency in AUMs**			
1. Bar X	*	*	*	*
2. Fish Creek	*	*	*	+200
3. Gold Creek	*	*	+1,082	+282
4. Little Sandy-Little Prospect	+2,114	+9,268	-935	-26
5. Steamboat Mountain	*	+381	+909	*
6. Little Colorado	+4,398	*	*	-60
7. Red Desert	*	*	-1,549	*
8. Bush Rim	*	-250	+2,428	*
9. Continental Peak	*	*	*	-3
10. Pacific Creek	+1,638	+2,153	+1,990	-81
11. Sands	+1,578	+1,442	+725	*
12. White Acorn	*	*	+102	+458
13. Prospect Mountain	*	+3,357	+140	-51
14. Reservoir	+946	*	*	-41
15. Poston	*	+770	*	-46
16. Pine Creek	*	*	*	+73
TOTAL	+10,674	+17,121	+4,892	+675

*Crucial winter habitat not located in allotment or associated custodial pastures. Bar X has crucial winter habitat for moose, but no animals have been identified (TABLES 2-36 and 2-37). AUMs on this table are from TABLES 3-24, 3-27, 3-30, and 3-32.

** This is the amount of excess or insufficient forage for the support of the desired wildlife populations after reductions for livestock, wild horse, and wildlife use of winter habitat during the summer and the loss of availability due to snow cover. + = excess; - + insufficient AUMs.

TABLE 3-41

PROJECTED CHANGES IN HABITAT FORAGE QUALITY
BY BIG GAME SPECIES

	Pronghorn			Mule Deer			Elk			Moose		
	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor
Present	57%	35%	8%	59%	33%	8%	53%	36%	11%	38%	48%	14%
23 Years	40%	50%	10%	50%	40%	10%	70%	25%	5%	20%	55%	25%
Change From Present	-17%	+15%	+2%	-9%	+7%	+2%	+17%	-11%	-6%	-18%	+7%	+11%

and in those areas where temporary conversions to cattle have already occurred.

During the rest treatments proposed, the fact that streams function as a dynamic continuum throughout their watersheds complicates improvement efforts or recovery since changes to any part of a stream influence the stability and habitat quality throughout the entire stream system.

The magnitude and intensity of effects on aquatic habitat as a result of the proposal would vary by grazing systems, allotments, and pastures. By comparing the aquatic habitat conditions noted at the time of the stream survey (1975 and 1976) to the level and type of use occurring at that time, anticipated future habitat conditions were estimated by reach of stream within allotments and pastures (APPENDIX 3D).

Streams

Impacts to stream habitat and organisms as a result of livestock grazing are primarily due to the utilization of accumulated vegetation required for physical habitat maintenance and to direct physical damage by trampling of streambanks (FIGURE 3D-3, APPENDIX 3D). The ensuing effects of these actions result in a decreased habitat productivity and carrying capacity as a result of accelerated bank erosion, increased sedimentation, reduced water quality, reduced spawning success, fish stock recruitment, decreased food (insect) production, and less suitable resident habitat (pools and riffles) for rearing fish. Most of the stream fisheries habitat in the Sandy area would fall in allotments under either a proposed alternately grazed system or a three-pasture rest-rotation system. Allotments, pastures, and miles of stream under these two primary systems are shown in TABLE 3-42.

Two-Pasture Alternately Grazed Systems

Two-pasture alternately grazed systems would affect 30% (88 miles) of the total stream habitat in the Sandy area. This includes 45% of the total stream habitat on national resource lands. Streams under this proposed grazing system constitute a major portion of the quality trout stream habitat within the Sandy area. Two-pasture alternately grazed systems, as noted in Chapter 1, combine Treatments A (graze season long) and C (rest season long).

Under Treatment A, utilization of stream bottoms by livestock would occur season long or until they "are grazed out"(per comm., Hormay 1976).

This concentration of animals and intensity of use would result in the utilization or reduction of shading and stabilizing streambank vegetation, especially palatable shrubs and young trees (Tuinstra 1967), plus extensive physical damage through trampling. The primary effects of these actions would result in the following changes in stream habitat:

1. The reduction of the natural fish holding and rearing capacity of streams through the reduction or elimination of protective overhanging vegetation cover. (Items 1, 2, and 7, TABLE 3-43).

2. The increase in summer temperature maximums through the reduced shading of streams. This would tend to lower oxygen saturation levels of water within the stream and at the same time increase metabolic rates (oxygen consumption) of fish. This would also limit the carrying capacity for game fish species and favor non-game or rough fish which have a wider tolerance range for both increased temperatures and lower oxygen levels (Lagler 1971; Lagler, Bardach and Miller 1962). Elevated summer temperature maximums also affect the distribution of aquatic organisms, growth rates, resistance to disease, and reproductive success as tolerance limits are approached (Bell 1972).

3. The reduction of stream energy budgets and productivity for food organisms (insects) through the reduction c loss of vegetative litter which would normally fall into the stream from the overhanging grass, shrub, or tree canopy and be consumed by decomposer and detritus-feeding (see Glossary) organisms (Hynes 1973). The detritus base food chain is of primary importance in streams with low mineral nutrient levels (Cummins 1975), for which most streams within the areas of two-pasture alternately grazed systems would qualify.

4. The acceleration in rates and degrees of streambank erosion as much as 1,362% (TABLE 3-43) which would create the following effects:

a. Increase levels of streambottom sedimentation, especially during times of increased summer temperature maximums, as warmer water has less capacity for carrying sediment and would therefore develop more extensive sediment deposition (Hynes 1973). Primary production is reduced when turbidity levels exceed 25 Jackson turbidity units (JTU) and as much as a 600% difference in food organisms per square foot can be found below a sediment source. Also, salmonid eggs (trout) have been found to experience a general mortality of 85% when as little as 10 to 20% of the voids in a spawning redd (see glossary) become filled with sediment (Bell 1972).

b. Accelerate the rate of channel movement through reductions in the physical accumulation of vegetation required for the development of streambanks with a high resistance to erosive streamflows. This would create streams up to 56% wider and 21% shallower with less habitat suitability for game fish. Streams in this condition could experience up to 328% accelerated lateral movement and channel changes with continued annual alterations of aquatic habitat (TABLE 3-43, Items 3 to 9).

c. Effect an overall net change in game fish populations as a result of the combined effects of alterations to aquatic stream habitat. Up to 70% fewer game fish and 57% fewer fish in general could be expected to occur (TABLE 3-43, Item 10).

Treatment C, rest season long, would have beneficial effects on the recovery and stabilization of streambanks through vegetative accumulation of grasses and forbs. This would provide improved habitat protection during high flows the following spring. Bank undercutting, mass wasting, loss of habitat, erosion, and resultant effects on aquatic organisms would still continue to be a problem in

TABLE 3-42

MILES OF STREAMS UNDER PROPOSED GRAZING SYSTEMS BY ALLOTMENT

Two- and Four- Pasture Alternately Grazed Systems

Allotment	Pastures	Approximate Miles of Stream Total	NRL
1. Fish Creek	1, 2	6	3
2. Gold Creek*	1-4	39	34
3. Little Sandy-Little Prospect	4, 5	14	6
4. White Acorn	4, 5	16	8
5. Prospect Mountain	4, 5	13	8
Total Miles		88	59
% of Total Stream Habitat		30%	45%

Three-Pasture Rest-Rotation Systems

Allotment	Pastures	Approximate Miles of Stream Total	NRL
1. Little Colorado			
a. Green River Use Area	1-3	30	10
b. Sandy Use Area	1-3	30	6
2. Continental Peak	1-3	6	4
3. Pacific Creek	1-3	48	32
4. Prospect Mountain	1	24	2
5. Reservoir	1	15	1
6. Pine Creek	1, 3	10	6
7. White Acorn	1-3	6	3
8. Little Sandy-Little Prospect	1-3	28	5
9. Poston	1-3	3	1
Total Miles		200	70
% of Total Stream Habitat		70%	55%

*Four-pasture alternately grazed system; others are two-pasture systems.

TABLE 3-43

COMPARISON OF STREAM HABITAT ELEMENTS BETWEEN A REACH UNDER SEASON-LONG GRAZING (TREATMENT A) AND A REACH WITHOUT LIVESTOCK GRAZING (TREATMENT C)

Stream Habitat Element	Condition Grazed	Condition Ungrazed	Percent Change From Ungrazed
1. Riparian Shrub Volume (cubic meters of aerial volume per square meter of ground surface)	6.67	85.3	-92
2. Overhead Cover (total number of units such as overhanging shrubs, undercut banks, etc., per acre of stream surface)	2,289	4,037	-43
3. Channel Habitat (percent of channel area with riffles or	78	54	+44
pools and runs	21	46	-54
4. Average Depth (feet)	1.06	1.34	-21
5. Average Channel Width (feet)	141	74	+91
6. Average Water Width (feet)	103	66	+56
7. Streambank Vegetation (feet of streambank covered with vegetation per mile of stream)			
Before flood	1,593	3,000	-47
After flood	1,305	3,366	-61
8. Streambank Erosion (feet of streambank eroding per 100 feet of streambank)	19	1.3	+1,362
9. Channel Movement (percent of channel length that changed position in the stream bottom)	77	18	+328
10. Standing Crop of Fish (pounds of fish per acre of stream surface)			
Brown Trout	63	213	-70
Other Fish	52	122	-57

*Grazed ÷ ungrazed - 1 x 100 = Percent Change.

Adapted from Marcuson (1970 and 1971) and Gunderson (1968).

areas having received physical bank damage or in areas lacking adequate deep-rooted (willow) bank stabilization. This would occur due to the preceding year's utilization of protective vegetative bank cover.

In areas where willow stands are well established, one season's rest would be anticipated to benefit aquatic habitat values (shading, overhead cover, and bank stabilization) for fisheries in 15 to 40 years (Tuinstra 1967, Gierisch 1964). In the Intermountain West, observations of streamside willows protected from grazing have noted a normal growth rate of approximately one foot per year with new growth willows being 3½ feet high in the fall of the fourth year (per. comm., Cuplin 1976). Willows along streambanks would therefore require more than one successive year's rest and a grazing formula designed with sufficient rest to provide for their growth requirements due to the close utilization experienced in areas such as meadows and drainage bottoms (per. comm. Hormay 1976). Martin, et al. (1951) note:

"Willows provide one of the principal sources of browse on many of the western mountain ranges. Although the foliage is most palatable to sheep, cattle probably make greatest use of these plants, because they usually range where willows abound. . . . The willows are most important as late summer feed because the foliage seemingly increases in palatability as the season advances. . . . Livestock tend to browse willows closely on the western ranges. In fact, the taller species commonly show a definite grazing line, and overgrazed, dead, or dying specimens are at times indicators of the former plentifulness of various species. These conditions are usually observable on areas where livestock concentrate, such as sheep bedgrounds, and along driveways, and are particularly noticeable on willows around meadows and draws on cattle ranges. . . . Ordinarily, however, scattered individuals, low bushes, and even open stands, which grow where livestock concentrate, are subjected to continuous close use and eventual destruction. Generally, wherever willows show serious injury, the herbaceous cover on the meadows is likely to be depleted"

Morris, et al. (1962) note, "Valley-bottom stands (are) important for moose within its range and heavily used by livestock in late summer, especially in heavily stocked pastures"

The use on willows from livestock grazing has been currently observed in the Sandy area under present levels of livestock use and support these conclusions. For example, personal observations of individual willows along the Big Sandy River have found that on willows grazed one season, then rested (or not experiencing any grazing pressure) the following season, regrowth occurred on less than half of the leaders which were grazed. Additionally, the regrowth which did occur was only about 50% the length of new year's growth on ungrazed stems (FIGURES 3-3, 3-4, 3-5 and 3-6). It has also been observed that grazing on the current year's growth results in the stem's dying back to the previous year's growth. This results in willows three to seven years old being only 10 to 20 inches high (FIGURE 3-7).

Willows are the primary deep-rooted bank stabilizing vegetation required on most streams in the Sandy area. It is a common observation to note 50 feet of accelerated bank erosion, then a willow—the presence of which preserves the bank for 50 feet downstream.

Another important function of riparian willow growth for aquatic habitat is in the maintenance of active beaver populations in first and second order streams of the Sandy area. These populations and the habitat they create are essential for sustaining adequate late summer, fall, and winter streamflows, which are critical to the survival and spawning success of fish in montane streams (Burton and Wesche 1974). These streams generally would be found in the areas of two-pasture systems. Beaver ponds also provide wintering and low flow survival habitat for fish in these headwater streams. Population ecology studies in eastern Wyoming (Call 1966) have found that an average of five beaver per colony require a total of 115 ounces (or 7.2 pounds) of bark per day for food alone. It is therefore doubtful whether one season's rest would provide sufficient recovery or growth of willows, especially in areas presently deficient, to maintain the aquatic habitat created by beaver which is necessary to satisfy the winter survival requirements of fish in first and second order streams. An estimated 10 to 20 grazing cycles (20 to 40 years) of a two-pasture alternately grazed system would produce willows with a suitable frequency, height, and cover volume to significantly benefit fisheries habitat.

Physical recovery of eroding or trampled stream banks would also require more than one successive year's rest. Personal observations of stream habitat studies in the Forest Service (USFS) Diamond Fork Allotment in Utah have noted that five to fifteen years of rest are necessary for recovery of bank stability and good stream habitat for fisheries. This is also supported by studies for Big Creek, Utah (Duff 1977). Similar studies in Idaho have also found that five to ten years are necessary for the improvement of stream-bottom gravels, once the sediment generating impact was alleviated (Platts and Megahan 1975). This period is relative to the scope and magnitude of sediment sources, but considering that streams act as a dynamic continuum, water quality impacts from upstream use areas would continue to be felt in a rested pasture reach of stream. In essence, "rest-rotation grazing systems may rest pastures but not stream bottoms"(Platts 1972).

The short-term effects of a two-pasture alternately grazed system would be primarily related to changes in aquatic habitat through physical damage by trampling and reduced stability of streambank cover habitat. Anticipated major benefits would be minimal for fisheries populations or aquatic habitat due to the overriding intensity of utilization which would occur every other year. Physical and biological recovery, in conjunction with continuing physical damage, would result in a general reduction in stream habitat quality from the existing condition to the next lowest condition as noted in FIGURE 3-8.

As an example, studies on Big Creek in Utah (Duff 1977) have found that after four year's rest and recovery inside a stream study exclosure, stream habitat condition was set back four years to its previous condition, and

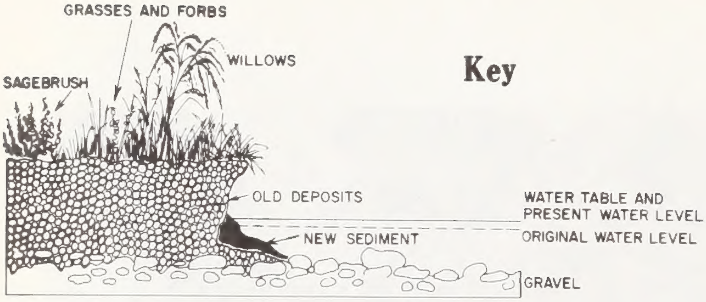
FIGURE 3-3. Numerous young willows along a bank of the Big Sandy River, subsequent to being grazed.

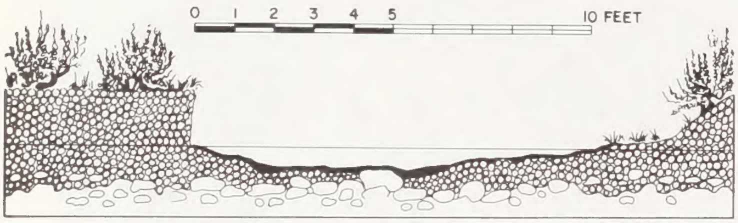
FIGURE 3-4. Closeup of an individual willow (lower left corner of FIGURE 3-3) which has been grazed.

FIGURE 3-5. Same photo point as FIGURE 3-3 taken during the fall after one year's rest. Note the amount of recovery experienced by the willows.

FIGURE 3-6. Same close up photo point as FIGURE 3-4 noting the amount of regrowth which has occurred on the individual after one year's rest, or lack of use.

FIGURE 3-7. GRAZED WILLOWS. These three- to seven year-old willows are typical along many grazed areas of streams in the Sandy area.



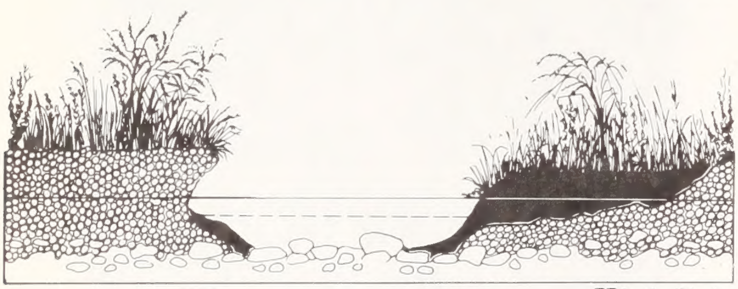


Poor

Channel wide, shallow and easily warmed by full exposure to solar radiation. Low bank stability with active bank erosion. Riparian vegetation quite limited, sagebrush to the streambank in many areas. Low riparian water table. Bottom sediment approaches 60%+, smothering gravel deposits. Habitat for aquatic or terrestrial wildlife essentially nil. Similar to conditions of heavy grazing impact.

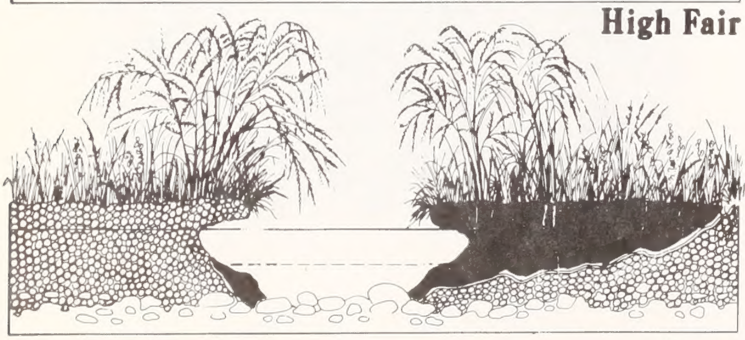
Low Fair

Riparian vegetation begins to form on silted bars and banks forming a sediment trap which builds up banks and begins to confine the channel. Water surface still fully exposed to warming, but level begins to rise, forcing out riparian sagebrush and bringing back riparian vegetation. As flow becomes confined, sediment is reduced to 40-60%. Conditions similar to those of moderate grazing pressure. Willow growth depressed. Habitat value to aquatic or terrestrial wildlife is still quite limited.



High Fair

Semi-confined by development of riparian vegetation with dense root mass. Banks stabilized by vegetation and bottom sediment reduced to approximately 20-30%. Rising water table is reducing sagebrush in favor or riparian grass shrubs. Stream continues deepening as bank resistance to erosion increases. Pools and riffles for fisheries are improving as more gravel is exposed. Representative of light grazing pressure.



Good

Confined-deep channel, elevated riparian water table, fully developed vegetation in riparian zone stabilizing cutbanks, deposited sediment and over hanging banks. Physical cover highly developed for both aquatic and terrestrial organisms. Bottom gravels clean with only 10-15% sedimentation. Reduced water temperatures due to 40-60% shading of surface area. Similar to conditions of very limited grazing or protected areas.

Adapted from "Guidelines for Management of Trout Habitat in Wisconsin," 1967.

FIGURE 3 - 8 Effects of Cattle Grazing on Trout Habitat

channel stability was set back two years when trespass cattle were moved into the exclosure for a period of only six weeks.

TABLES 3-44 and 3-45 illustrate the estimated short-term and long-term habitat changes by allotment and estimated shifts in fish populations using methodologies in APPENDIX 3D. A detailed analysis by stream is available upon request from the Rock Springs District Office. Long-term changes in habitat quality would be more subtle as these effects become cumulative and progress downstream, and stream habitat gradually adjusts to a point in equilibrium with the grazing use being received. Spawning and resident habitat quality within the two-pasture systems, it is anticipated, would decrease by about 15% and 30%, respectively, and game fish populations by approximately 40% to 50%.

Three-Pasture Rest-Rotation Systems

As proposed, three-pasture rest-rotation grazing systems would affect 70% (200 miles) of the total stream habitat in the Sandy area (TABLE 3-42). This includes 55% of the total stream habitat on national resource lands. Streams under this proposed grazing system constitute a major portion of the presently marginal or seasonal game fish habitat in the Sandy area. Three-pasture rest-rotation systems, as noted in Chapter 1, combine Treatments A or E with B and C. Under this system Treatment B (rest until seedripe, then graze) in combination with Treatments A and C would provide an additional half a season's rest as well as reduce the intensity of use on streambanks during that period of time. Recovery of grasses and forbs during this early season rest period would be anticipated and would help stabilize streambanks to some extent. However, considering the treatment implementation sequence and the proposed increased levels of use by livestock, particularly cattle, the significance of the benefits from this type of system for stream habitat maintenance or improvement would be questionable. As proposed in Chapter 1 for an ABC system, the treatment sequence would be to graze season long, rest until seedripe then graze, and rest season long.

The degree of use and effects on the aquatic environment from Treatment A would be expected to remove much of the current season's accumulated growth of protective vegetal bank cover especially in areas near aquatic habitat which receive the most intensive use. Associated with this would be trampled banks and accelerated erosion sources. During high water and overbank flows the following spring (the rest period of Treatment B), these conditions would prevail, and there would be primarily stubble (approximately one to three inches high) left with only 10 to 30% of the original vegetal cover height for streambank protection from erosion. More erosive turbulent flows would thereby be created, as opposed to laminar flows (see Glossary) over a well vegetatively armored bank. This would result in an increased potential for bank cutting, channel movement, and reduction of habitat elements noted in TABLE 3-43. Sediment generated during this period from previous bank damage and trampling would be deleterious to rainbow and cutthroat trout, which normally spawn during the spring.

The vegetative regrowth and habitat recovery which would begin to occur during the early season rest of Treatment B could be expected to be retarded by the onset of grazing during the latter part of the season. Sediment generated from bank damage and trampling during this period would be particularly deleterious to brown and brook trout, which spawn during the fall and whose eggs and hatchlings require clean gravel to survive the low streamflows of late summer, fall, and winter. Though probably not as extensive or severe as Treatment A, late season bank damage during Treatment B would also contribute to accelerated bank erosion the following spring. This accelerated bank erosion would, in turn, affect the spawning success of brook and brown trout that fall and of rainbow and cutthroat during the following spring of Treatment C, rest season long. Thus, by inference, a three-pasture rest-rotation system as proposed would provide only one year's time during which recovery with significance for aquatic habitat could be expected. The fact that this period of recovery is immediately followed by another Treatment A (graze season long) raises the question as to how much recovery would be sustained and how rapidly improvement of stream habitat would occur, if at all.

Two allotments, Pine Creek and Continental Peak, would have three-pasture rest-rotation systems which would utilize an EBC sequence rather than ABC. Treatment E (graze until seedripe, then rest) would have many effects similar to those of Treatment B. Removal of vegetative accumulations produced during the growing season would result in the reduction of protective vegetative bank cover and physical bank damage through trampling. This would affect fall spawning fish (brook and brown trout) later in the year during which time low streamflows would be less capable of moving the silt generated from accelerated bank erosion created during the period of grazing.

Growing seasons in these areas are essentially over by the time of rest, resulting in minimal vegetative regrowth prior to spring runoff the following year. As noted earlier, field observations have indicated that grazing on the current year's willow growth results in a dieoff back to the previous year's growth with little if any new production or growth accumulation on those stems which have been grazed. Early season grazing would also affect spring spawning game fish through bank trampling and sediment generation when banks are highly susceptible to trampling and erosion because of high water.

It is anticipated, however, that the degree or magnitude of effects on the aquatic environment would be about the same as Treatment B and less than Treatment A. During this period, the intensity of use would be expected to be less with less physical habitat trampling than would be expected in Treatment A.

Personal observations of a five-pasture rest-rotation grazing system in the BLM Rawlins, Wyoming, District which incorporates an early season rest (Treatment B) after a full season rest have noted good recovery of grasses and forbs along streambanks during the past

TABLE 3-44

ESTIMATED SHORT-TERM FISHERIES HABITAT CONDITIONS UNDER PROPOSAL BY ALLOTMENT, CUSTODIAL PASTURE, AND NO GRAZING AREA

Allotment	Total Stream Miles	NRL Total Stream Miles	NRL Miles Inventoried	Spawning Habitat Potential - Good Mi.	%x	Fair Mi.	%x	Poor Mi.	%x	None Mi.	%x	Resident Habitat - Good Mi.	%x	Fair Mi.	%x	Poor Mi.	%x	None Mi.	%x	Est. Game Fish(Trout) Populations Per Mile
1. Bar X	* 9.00																			
2. Fish Cr.	5.50	2.50	1.85			2.26	41	3.25	59					1.65	30	2.37	43	1.49	27	Unknown
3. Gold Cr.	44.00	33.75	33.50	9.68	22	8.80	20	14.52	33	10.56	24	4.84	11	30.36	69	6.60	15	1.76	5	200-800
4. Little Sandy-Little Prospect.	42.25	11.25	8.45			1.27	3	30.00	71	10.99	26	1.27	37	36.34	86	4.65	11			0-800
5. Steamboat Mountain	* 9.50	6.50																		
6. Little Colorado	60.25	16.50	23.50					23.50	39	36.75	61			53.62	89	6.63	11			1,000
7. Red Desert																				
8. Bush Rim																				
9. Continental Peak*	6.25	4.25	0.25			0.25	100									0.25	100			600-1,500
10. Pacific Creek	48.00	32.00	24.00					11.52	24	36.48	76			5.28	11	15.36	32	26.88	56	0-1,000
11. Sands																				
12. White Acorn	17.75	7.05	3.00			3.02	17	11.89	67	3.02	17			11.89	67	5.86	33			500-2,000
13. Prospect Mountain	27.75	9.75	8.50	1.67	6	10.55	38	15.54	56			16.37	59	9.71	35	1.67	6			100-800
14. Reservoir	14.50	1.00	1.00							14.50	100			10.88	75	3.63	25			Seasonal
15. Poston																				
16. Pine Creek	10.50	6.25	4.55			0.74	7	2.3	22	7.46	71			1.16	11	2.42	23	6.93	66	1,000
ALLOTMENT TOTALS	295.25 *-24.50 +270.75	130.80	108.60	11.35	4	26.89	10	112.53	42	119.76	44	22.48	8	160.89	60	49.44	18	37.06	14	425-1,100
Custodial Pastures																				
C-6		1.00	1.00					0.33	33	0.67	67			0.77	77	0.23	23			
C-21		2.00	0.80							2.00	100			1.50	75	0.50	25			
C-26		1.25	1.25	0.75	60	0.25	20	0.25	20			0.50	40	0.75	60					
Palmer Draw		3.00	3.00			0.50	17	2.50	83			3.00	100							
CUSTODIAL AND NO GRAZING TOTALS		7.25	6.05	0.75		0.75		3.08		2.67		3.50		3.02		0.73				
AREA TOTAL		138.05	114.65	12.10		27.64		115.61		122.43		25.98		163.91		50.17		37.06		

+Total miles for weighted habitat condition estimates.
xPercentages based on condition distribution of NRL miles surveyed.
See TABLE 2-56 for existing conditions. A detailed analysis is available upon request from the Rock Springs District Office.
*Miles deleted due to nonfisheries habitat, unknown condition or totally nonNRL stream bottom.

TABLE 3-45

ESTIMATED LONG-TERM FISHERIES HABITAT CONDITION UNDER PROPOSAL BY ALLOTMENT, CUSTODIAL PASTURE, AND NO GRAZING AREA

Allotment	Total Stream Miles	NRL Total Stream Miles	NRL Miles Inventoried	Spawning Habitat Potential								Resident Habitat								Est. Game Fish (Trout) Populations Per Mile
				Good Mi.	%	Fair Mi.	%	Poor Mi.	%	None Mi.	%	Good Mi.	%	Fair Mi.	%	Poor Mi.	%	None Mi.	%	
1. Bar X	* 9.00																			
2. Fish Creek	5.50	2.50	1.85					3.85	70	1.65	30					3.25	59	2.26	41	Unknown
3. Gold Creek	44.00	33.75	33.50	7.48	17	7.04	16	18.92	43	10.56	24	3.96	9	24.20	55	13.20	30	2.64	6	200-800
4. Little Sandy-Little Prospect.	42.25	11.25	8.45			1.27	3	28.73	68	12.25	29	3.80	9	28.31	67	10.14	24			0-800
5. Steamboat Mountain	* 9.50	6.50																		
6. Little Colorado	60.25	16.50	23.50					18.68	31	41.57	69			53.02	88	6.03	10	1.21	2	1,000
7. Red Desert																				
8. Bush Rim																				
9. Continental Peak	*6.25	4.25	0.25					0.25	100							0.25	100			600-1,500
10. Pacific Creek	48.00	32.00	24.00					10.08	21	37.92	79			4.80	10	13.92	29	29.76	62	0-800
11. Sands																				
12. White Acorn	17.75	7.05	3.00			3.02	17	8.88	50	5.86	33			5.86	33	11.89	67			200-1,500
13. Prospect Mountain	27.75	9.75	8.50	0.83	3	9.71	35	17.21	62			11.38	41	12.21	44	4.16	15			100-500
14. Reservoir	14.50	1.00	1.00							14.50	100			10.88	75	3.63	25			Seasonal
15. Poston																				
16. Pine Creek	10.50	6.25	4.55			0.74	7	2.31	22	7.46	71			0.95	9	2.63	25	6.93	66	200-800
ALLOTMENT TOTALS	295.25 *-24.50 +270.75	130.80	108.60	8.31	3	21.78	8	108.91	40	131.77	49	19.14	7	140.23	52	69.10	26	42.80	16	300-950
Custodial Pastures																				
C-6		1.00	1.00					0.28	28	0.72	72			0.66	66	0.11	11	0.22	22	
C-21		2.00	0.80							0.80	100			0.50	63	0.30	38			
C-26		1.25	1.25	0.50	40	0.25	20	0.25	20			0.50	40	0.25	20	0.25	20			
Palmer Draw		3.00	3.00			0.75	25	2.25	75			3.00	100					0.22		
CUSTODIAL AND NO GRAZING TOTALS		7.25	6.05	0.50		1.00		2.78		1.52		3.50		1.41		0.66		0.22		
AREA TOTAL		138.05	114.65	8.81		22.75		111.69		133.29		22.64		141.64		69.76		43.02		

+Total miles for weighted habitat condition estimates.
xPercentages based on condition distribution of NRL miles surveyed.
See TABLE 2-56 for existing conditions. A detailed analysis is available upon request from the Rock Springs District Office.
*Miles deleted due to nonfisheries habitat, unknown condition or totally nonNRL stream bottom.

twelve years of operation, but physical trampling, sedimentation, and lack of willow reestablishment are still limiting factors for the aquatic environment (FIGURE 3-9).

As another comparison, U. S. Forest Service's Diamond Fork grazing programs near Provo, Utah, have found it necessary to completely rest pastures for four years prior to implementation of grazing systems incorporating additional rest in sequential years in order to obtain recovery and improvement of stream habitat and fish populations (Kimble and Savage 1974). FIGURES 3-10 and 3-11 show the effects of the grazing system.

It would therefore appear that the three-pasture rest-rotation systems as proposed combined with major increases in cattle use proposed in the allotments (except for Little Sandy-Little Prospect) would, at best, maintain existing stream habitat conditions over the short term. While they could improve or maintain present habitat conditions in some areas over the long term, the anticipated result would be a slight decline of habitat conditions in those areas where cattle use is presently low to nonexistent and streambanks are less than 50% stable to livestock pressures (TABLES 3-44 and 3-45). A detailed analysis by stream is available for review upon request from the Rock Springs District Office.

Threatened and Endangered Species

No threatened or endangered aquatic organisms have been identified to date in the Sandy area. Seasonal use of the lower Big Sandy River (Farson to the Green River) by roundtail chubs, bluehead, and flannelmouth suckers, which Baxter and Simon (1970) feel warrant rare considerations due to their limited habitat within the State of Wyoming, is not anticipated to be affected by the proposal. While little definitive information is available on the critical habitat elements required by suckers, an inverse relationship with habitat quality for game fish is often assumed, and on the basis of predicted habitat trends for seasonal game fish use of the lower Big Sandy, the proposal could possibly improve the stream habitat of the Big Sandy Use Area for nongame fish.

Formal consultation under Section 7 of the Endangered Species Act of 1973 has been initiated with the U.S. Fish and Wildlife Service.

Custodial Pastures

The anticipated system of use within custodial pastures for the purposes of analysis is considered to be that of Treatment A, graze season long. Estimated habitat condition and trend for pastures C-6, C-21, and C-26, which contain the most significant mileage of inventoried NRL streams (approximately 45% (7.25 mile) of all NRL stream miles within custodial pastures), has been projected on this basis and is shown in TABLES 3-44 and 3-45. Where less intensive use than season-long grazing occurs in custodial pastures, existing conditions would probably be maintained over the short term and attain projected short-term conditions under Treatment A over the long term. Nonuse in these areas would probably lead to a gradual habitat improvement over the long term. It is anticipated that the quality of the good and fair spawning and resident habitat would decrease by about 40% and 50%, respectively, and game fish populations by approximately 50 to 70% in these areas.

No Grazing Areas

The proposed discontinuation of grazing in Palmer Draw is anticipated to result in the maintenance of 3.0 miles of existing good quality resident habitat and the long-term improvement of 0.75 miles of spawning habitat from poor to fair condition on the Sweetwater River. Long-term improvement of streambank vegetal cover in areas presently experiencing bank cutting and mass wasting should improve the stream habitat channel stability 9%, or from the present high fair to a good stability rating.

Range Improvements

The development of supportive projects (water developments and fences) would be anticipated to have minimal effects on aquatic habitat in general. Of the 63 earthfill and 33 pit type reservoirs proposed for development, only six are proposed that would be fenced for the control of livestock and management of aquatic habitat. Manmade stock ponds have been found in numerous studies to provide more aquatic habitat, based on use percentages for waterfowl, than natural areas if aquatic habitat productivity is maintained (Lokemoen 1973). While construction of upland water sites would hold some livestock use within the given area, use on stream bottoms or shorelines is not anticipated to be reduced significantly for the reduction of impacts to aquatic habitat.

According to Hormay (per. comm., 1976), "Vegetation in certain areas, such as meadows and drainage ways, are invariably closely utilized under any stocking rate or system of grazing. Such use may be detrimental to wildlife, aesthetic, recreational, or other values. Where this is the case, about the only way to preserve values is to fence the area off from grazing. Reducing livestock or adjusting the grazing season usually will not solve such a problem" New aquatic habitat would be created at reservoir sites, but its value for fisheries would be limited due to the small size of reservoirs proposed. The primary benefits of these reservoirs or pits would be in the creation of potential sites for aquatic habitat and food production for waterfowl and birds.

Summary of Impacts

The general aquatic habitat trend within the Sandy area would continue to be downward as a result of the proposed action. The fact that streams function as a dynamic continuum throughout their watershed complicates improvement efforts or recovery during the rest periods as proposed. Considering the activation of addi-

FIGURE 3-9. Recovery and stabilization of streambanks by grasses and forbs are occurring after 12 years operation of a rest-rotation system incorporating additional rest (greater than 1 year) in sequence. But physical trampling, sedimentation, lack of overhead cover and shading are still limiting factors for the aquatic environment.

FIGURE 3-10. A stream habitat study exclosure near Provo, Utah. Looking upstream to an area outside the exclosure and under the rest-rotation grazing system, this picture was taken in the winter of 1976 after approximately 12 years of complete rest in an area which was partially planted with willows to help speed recovery.

FIGURE 3-11. A view from above the exclosure in an area under the rest-rotation system, looking back towards the photo point of FIGURE 3-10 inside the exclosure. Note fenceline. In addition to the grazing system, this stream bottom receives use from recreational horses during the fall hunting season.

tional livestock use and the partial or full conversions to cattle use, it is significant that habitat condition shifts are not anticipated to be greater than those shown. Except for the anticipated negative effects of two-pasture alternately grazed systems, those three-pasture systems designed, under the use levels proposed, could be able to reduce the magnitude of change to the aquatic environment, but the elimination of associated impacts as a result of livestock grazing would not be likely to occur. As Hormay (1976) has noted, "Reducing livestock or adjusting the grazing season usually will not solve such a problem"

Generally speaking, aquatic habitat in areas under the proposed three-pasture rest-rotation grazing systems would be anticipated to be essentially maintained in its present condition. A few areas with high improvement potentials would be expected to improve due to increases in streambank cover, primarily grasses and forbs. On the other hand, a few areas formerly experiencing little livestock impact are anticipated to decline as a result of activation of nonuse and conversions to cattle.

The proposed two-pasture alternate systems are anticipated to have the greatest effect on aquatic habitat, especially game fish habitat, within the Sandy area.

Anticipated trends and shifts in stream habitat conditions for the area as a whole are shown in TABLE 3-46. A pasture level analysis is available upon request from the Rock Springs District Office.

Estimated changes in game fish populations are shown in TABLE 3-47.

WILD HORSES

Assumptions

Wild horse numbers would be reduced to the management levels recommended in the wild horse management plans prior to implementation of the grazing systems of the proposed action (TABLE 3-48). Allocation of forage for horses would be as shown in TABLE 1-4. Horses would be located in areas under three-pasture rest-rotation systems.

The average number of horses to be managed in the Little Colorado management unit would be 150 animals. The horses would be located in the proposed Green River Use Area and Farson Use Area. Both use area boundaries would be fenced. The Green River Use Area would utilize pasture fences proposed to control livestock, while horses in the Farson Use Area would be controlled by water availability (MAP 1-3).

The average number of horses to be managed in the Continental Peak Wild Horse Unit would be 650. This unit includes the Red Desert, Bush Rim, and Continental Peak Allotments. Control of livestock would be accomplished by herding and water availability. No fences between the above named allotments would be constructed except for the exterior boundary separating these allotments from adjoining allotments and the proposed checkerboard fence. The existing Rock Springs-Rawlins District boundary fence would remain.

Impacts to wild horses are difficult to quantify because of the lack of knowledge of the effects of grazing management and fences; therefore, the following ranges are provided as a measurement of the impacts:

Minimal—The impact(s) would or could affect less than 30% of the horse population.

Medium—The impact(s) would or could affect between 30% and 70% of the horse population.

High—The impact(s) would or could affect more than 70% of the horse population.

Three-Pasture Rest-Rotation System

Concentration of cattle created by Treatment A in the proposed action could have a minimal effect on horse distribution and use of "home ranges"(see Glossary of Terms). The horses may try to avoid the cattle by moving into unused areas farther away from water, although this impact should be minimal since horses commonly travel farther from water than cattle. In both of the wild horse management areas, even with the proposed additional water developments, many areas are still going to be ungrazed by livestock, because of the distance from water. TABLE 3-49 shows areas that would be ungrazed by livestock.

Even with the available forage in the grazed pastures, the horses may move out of the "home range"and into areas not grazed and previously unused because of the increased human activities associated with the grazing plan such as riders or maintenance of fences and water developments. Traditional areas of use could be changed because of proposed fencing affecting their habits and behavioral functions. Total effects cannot be stated until further studies are made, but the effect should be minimal because of the size of the proposed pastures.

Shutting water off to control livestock could have a high impact upon the horses. The degree of impact depends on whether the horses can adjust and move to other areas where water is available. If the horses should not move, their life expectancy could be reduced. If the horses adjust and move to areas where water is available, the impact would then be an estimated medium reduction in total living space. This could cause increased competition among bands for forage, mixing of bands, competition between stallions, etc. Mixing of bands could result in less inbreeding.

Treatments A and B could have a high impact when applied to the preferred winter range area. This could result in lack of adequate forage for the winter, especially during years of below average production. The lack of forage could result in lost weight, poor condition, and increased mortality.

Treatment C would provide a high benefit to the horses by leaving forage available for winter use on their preferred areas when it is applied to these areas. These unused areas free from livestock would also be of high benefit by being available during the summer if the

TABLE 3-46

ANTICIPATED CHANGES IN STREAM HABITAT
UNDER PROPOSED ACTION

Spawning Habitat Potential*

	Miles and Percent of Area			
	Good	Fair	Poor	Virt. None
Present (miles)	24 (9%)	35 (13%)	100 (37%)	111 (41%)
Short Term (12 yrs)	19 (7%)	30 (11%)	103 (38%)	119 (44%)
Long Term (23 yrs)	16 (6%)	24 (9%)	103 (38%)	130 (48%)

Resident Habitat Quality*

	Miles and Percent of Area			
	Good	Fair	Poor	Virt. None
Present	27 (10%)	171 (63%)	30 (11%)	43 (16%)
Short Term (12 yrs)	22 (8%)	152 (56%)	51 (19%)	46 (17%)
Long Term (23 yrs)	19 (7%)	133 (49%)	68 (25%)	51 (19%)

*Percentages based on NRL stream miles surveyed from Sandy area totals.

TABLE 3-47

ESTIMATED GAME FISH POPULATIONS PER MILE
UNDER THE PROPOSED ACTION

	Allotment	Present	Short Term*	Long Term*
1.	Bar X	-	-	-
2.	Fish Creek	Unknown	Unknown	Unknown
3.	Gold Creek	200-1,320	200-800	200-800
4.	Little Sandy-Little Prospect	0-880	0-800	0-800
5.	Steamboat Mountain	-	-	-
6.	Little Colorado	1,000	1,000	1,000
7.	Red Desert	-	-	-
8.	Bush Rim	-	-	-
9.	Continental Peak	630-2,350	600-1,500	600-1,500
10.	Pacific Creek	0-1,500	0-1,000	0-800
11.	Sands	-	-	-
12.	White Acorn	700-3,430	500-2,000	200-1,500
13.	Prospect Mountain	100-1,220	100-800	100-500
14.	Reservoir	Seasonal	Seasonal	Seasonal
15.	Poston	-	-	-
16.	Pine Creek	2,930	1,000	200-800

*Compiled from TABLES 3-44 and 3-45.

TABLE 3-48

PROPOSED WILD HORSE REDUCTIONS

Management Unit	Present Numbers*	Management Numbers Minimum	Maximum
Continental Peak	3,219	500	750
Little Colorado	866	100	200
TOTALS	4,085	600	950

*Derived from TABLE 2-59. The horses in the checkerboard area would be removed.

TABLE 3-49

ACRES IN WILD HORSE MANAGEMENT AREAS
GRAZED AND UNGRAZED BY LIVESTOCK

Management Areas	Total Acres	Acres Used 2/ By Livestock	Acres Not Used 3/ By Livestock
Little Colorado	508,914	186,791	322,123
Continental Peak 1/	438,400	175,002	263,398
TOTALS	947,314	361,793	585,521

1/ Includes Red Desert, Bush Rim, and Continental Peak Allotments.

2/ Summarized from TABLE 2-6.

3/ Horses could use these acres with little competition from livestock except in late fall when snow is available.

horses would move into these areas and water is available.

Range Improvements

The estimated number of horses that would be lost because of fencing is unknown; however, fences could have the following impacts depending on location and season:

1. Medium—Fences could restrict free movement and confine horses to areas not normally used in winter or summer. These physical barriers during severe winters could have a high impact and trap horses in areas of heavy snow cover, resulting in starvation.
2. High—Fences could cause injury to the horses. Horses trying to move across fences could become entangled, inflicting serious injuries, and many could become permanently maimed or eventual death could occur.

Cattleguards associated with the fences could have a minimal impact. However, if wild horses were caught in the cattleguard, there could be injury and eventual death to a few horses. The horses could get a leg or legs broken or caught between the rails. Potential for this type of injury would be greater during the winter if the guards are partially snow-covered or when horses are under stress.

Water projects should provide a medium benefit to the horses by extending their summer use areas and reducing use where the summer and winter use concentration areas overlap. It could also cause the reverse effect (minimal) by making more areas usable by summer livestock, thus reducing the area ungrazed by livestock and increasing competition between livestock and horses for forage.

Summary of Impacts

Overall, no change in the wild horse populations would be anticipated as a result of implementing the proposed action. Populations are expected to remain within the allowed level of about 800 animals.

Treatments A and B in Pasture 1 of the Green River Use Area could pose a medium problem in drought years of low forage production.

The types of fence proposed would have an estimated high effect on wild horses' free-roaming behavior. If the horses are put under stress, they may run into the fence and become entangled or injured. Free movement within the Continental Peak management area and Farson Use Area would be unrestricted.

Water control of livestock could have the most significant effect (high) on horses if they are unable to get water because of fences or because wells are shut off. Death could result if they did not move into new areas. This would be the case in the Farson Use Area and the Continental Peak, Red Desert, and Bush Rim Allotments. Lack of forage should be a minimal problem since there would be some rested areas.

PALEONTOLOGICAL RESOURCES

The proposed livestock grazing systems should not have an impact upon paleontological values because fossil remains are either buried or exposed in outcrops where livestock cannot affect them. The proposed construction of wells, pipelines, and reservoirs could destroy some buried paleontological resources, although there is a low probability of this occurring. Significant fossil bearing formations are located in all allotments except the Bar X, Fish Creek, Gold Creek, and Pine Creek Allotments and the eastern half of the White Acorn Allotment. About 80% of the remaining allotments are underlain by potentially fossiliferous formations. However, the fossils are usually in a rock matrix which the proposed range improvements could rarely, if ever, penetrate.

CULTURAL RESOURCES

Since cultural resource impacts are difficult to quantify, the following ranges are provided as a measurement of the probability of impact. These impacts are on both the site's immediate area and its integrity (see Glossary).

Minimal—The impact(s) would (could) be small or slight; less than 15% effect on the cultural values.

Medium—The impact(s) would (could) be obvious; between 15% and 50% effect on the cultural values.

Severe—The impact(s) would (could) be significant; 50% to complete destruction of cultural values.

Archeology

The primary impact of the grazing systems in areas other than water sources would occur during the spring (predominantly May and June) when the ground is moist. Trampling and sheet erosion would lead to uncovering and damaging sites by the vertical and horizontal displacement of artifacts. Most of the sheet erosion is due to geologic causes; however, some of it is due to livestock trampling. Based on TABLE 3-2 (soils section), TABLE 3-50 was developed showing the percentage of reduced sheet erosion due to the proposed action and the percentage of that reduction due to other than natural causes. As sheet erosion is reduced, the damage to sites could be decreased by the percentages indicated in TABLE 3-50.

Wind erosion would lead to severe vertical shifting of artifacts (especially in sand dunes), slight horizontal displacement, and increased vandalism of sites as they become visible to collectors. In addition, trampling would lead to the breakage and relocation of artifacts. In one study in eastern Colorado, a collection of artifacts from around a stock tank revealed that all had edge modification from cattle trampling (Knudson 1974). The modifications were severe enough that the artifacts could be classified as tools rather than debritage (see Glossary of Terms). This would affect to a high degree the study of artifacts from the surface of these areas because trampling from large animals would irreparably damage

TABLE 3-50

ESTIMATED PERCENTAGE OF REDUCED SHEET EROSION

Allotment	Percent Reduction From Present	Percent of Reduced Erosion Due to Other Than Natural Causes*
Bar X	68	28
Fish Creek	38	45
Gold Creek	16	47
Little Sandy-Little Prospect	35	65
Steamboat Mountain	10	94
Little Colorado:		
Green River Use Area	30	50
Farson Use Area	25	67
Big Sandy Use Area	27	65
Red Desert	11	61
Bush Rim	19	86
Continental Peak	17	85
Pacific Creek	22	84
Sands	09	79
White Acorn	24	70
Prospect Mountain	32	66
Reservoir	25	61
Poston	27	70
Pine Creek	17	52

*This is erosion caused by livestock trampling, vehicle use and other surface disturbance.

artifacts. The personal observations of a number of archeologists are that cattle break and rearrange artifacts around water sources or in areas of heavy trailing. Sheep use tends to be more severe as they spread out more, spreading the damage over a wider area, although the types of damage are the same as for cattle.

In another study in northern Nevada, 48% of a group of artifacts received some form of damage from trampling, ranging from nicking to major breakage. Over 38% had been horizontally displaced and almost all were vertically displaced (Roney 1977). These impacts would seriously affect the study of the site by making it difficult or impossible to reconstruct technological and social activity use areas at a site.

In the short term the grazing systems would lead to increased erosion, which would be a medium impact to some sites; however, after the systems are in full operation (long term), there would be increased vegetation that would lead to less erosion than at present, thereby helping to preserve sites. However, any damage done in the short term would be irreparable.

Most of the impact from trampling would come in areas where there is a heavy concentration of animals such as around water sources, heavily used trails, some fence lines, and salt sources. It is estimated that the heaviest cattle concentrations causing impacts to cultural values would occur within ¼ mile of water and salt sources. TABLE 3-51 shows the approximate percent of increase in livestock use above the present by allotment. TABLE 3-52 represents the existing trampling, the maximum seasonal trampling by cattle that would occur at any one time in the future, and the short-term and long-term trampling under the proposed action. TABLE 3-53 indicates the change from the present in the amount of acres that livestock would use. These acres were derived by subtracting the number of acres used presently from the number of acres that would be used in the short term. The percentages reflect the increased acres used because of new water development.

In the Steamboat Mountain, Continental Peak, Sands, White Acorn, and Poston Allotments, the amount of land used would increase by more than 10%. The difference between the land receiving intensive use in the present and in the proposed seasonal use is reflected in TABLE 3-54.

The intensive use represents moderate, heavy, and severe use which would occur. The Fish Creek, Gold Creek, Little Colorado, Red Desert, Bush Rim, Continental Peak, Pacific Creek, White Acorn, and Pine Creek Allotments would have significant increases of more than 8% (TABLE 3-54) over the present intensive use acreages. Since trampling is directly related to livestock use, the above figures indicate that a number of allotments would see a dramatic increase in the amount of trampling.

Grazing Treatment A would have the most severe impact upon archeological resources because the reduction in vegetal cover before winter would result in greater erosion and more severe trampling in the spring. Treatment B would cause only a medium impact to archeological resources as the animals would be in the area only a short time. Treatment C would have a minimal effect upon archeological resources as erosion would be reduced from the present rate in the long term. Treatment D would have a medium effect upon archeological resources as there would be increased erosion through trampling. Treatment E would have a medium impact on archeological sites. Sites on allotments under these treatments would be affected in the manner and degree indicated. The presence of livestock on the range would also detract from the prehistoric environment by the introduction of domestic animals.

Spring developments could severely disturb or destroy any site that is associated with it. The cultural contract survey team found at least one site around every spring surveyed; of the six springs proposed for development, three in the Sands Allotment and one in the Poston Allotment contain archeological remains. At the Finley Site (Sands Allotment), cattle, horses, and wildlife have trampled most of the native plants into the substratum of the spring from which pollen samples (see Glossary) were taken. The churning extended for six inches beneath the surface and has caused severe distortion of the upper levels of the pollen profiles (Hansen 1957). While a spring development would seriously impact any cultural values present on the immediate site, their preservation through a salvage operation as is required during construction would be a more beneficial operation than allowing continued trampling by livestock and thus a continual loss of cultural values.

There would be a possibility of proposed well sites containing significant archeological remains. If a site was present on the well location, it would be severely damaged or destroyed by the construction of the well. There are two sites of potential National Register significance, JS-4 and FG-7 (archeological site designations assigned by the Rock Springs District Archeologist), that would have their remaining stratified material severely impacted by proposed well construction and the trampling that would result in the vicinity of the completed well.

Pipeline construction activities would have a severe impact destroying artifacts and disturbing their location. One site of potential National Register significance, BF-1, would also receive severe trampling damage on its best remaining stratified area because of the presence of a stock trough.

Two of the reservoirs proposed for the Steamboat Allotment would be built close to springs. In both cases there are large sites nearby which would be either directly or indirectly affected by the reservoir. FG-4 would be moderately impacted and FG-5 severely impacted. Reservoirs in several other allotments are close to ephemeral streams which have a high potential for having sites. Many of the reservoirs are proposed for intermittent drainages in areas far from any permanent water source, which give them a low probability of having a site nearby. Significant sites near minor drainages can occur, as evidenced by the Eden-Farson Site. While the increased number of reservoirs would tend to pull some livestock away from springs and other permanent water sources, the introduction of more livestock would more than offset the beneficial impact of inducing livestock

TABLE 3-51

PROJECTED PERCENT CHANGE IN LIVESTOCK UNDER THE PROPOSED ACTION BY ALLOTMENT

	Change in Livestock Percent	Change in Livestock Number		Change in Livestock Percent	Change in Livestock Number
Bar X	9	89	Bush Rim	-1	-42
Fish Creek	55	370	Continental Peak	4	246
Gold Creek	44	1,681	Pacific Creek	10	1,288
Little Sandy-Little Prospect	12	1,732	Sands	20	911
Steamboat Mountain	6	137	White Acorn	4	211
Little Colorado:			Prospect Mountain	63	3,022
Green River Use Area	26	5,433			
Farson Use Area	11	1,888	Reservoir	43	858
Big Sandy Use Area	18	2,557	Poston	17	700
Red Desert	8	1,570	Pine Creek	3	49

TABLE 3-52

TRAMPLING IMPACT UPON NONSITE-SPECIFIC CULTURAL RESOURCES BY ALLOTMENT

Allotment	Estimated Existing Trampling Total Acres*	Combined Acres**	% of Total	Seasonal Under Proposed Action Total Acres*	Combined Acres**	% of Total
Bar X	6,895	2,531	36	6,895	1,640	24
Fish Creek	7,237	2,464	34	7,237	3,906	54
Gold Creek	30,525	11,841	39	30,525	14,936	49
Little Sandy-Little Prospect	185,660	47,728	26	185,660	43,774	24
Steamboat Mountain	40,537	3,273	8	40,537	2,276	6
Little Colorado	726,956	95,510	13	726,956	133,763	18
Red Desert	245,375	2,230	1	245,375	49,294	20
Bush Rim	104,547	2,832	3	104,547	16,566	16
Continental Peak	88,478	9,935	11	88,478	19,020	21
Pacific Creek	202,856	14,704	7	202,856	30,730	15
Sandy	114,852	8,523	7	114,852	10,278	9
White Acorn	46,794	8,689	19	46,794	19,410	41
Prospect Mountain	66,751	15,787	24	66,751	14,427	22
Reservoir	35,545	7,209	20	35,545	6,237	18
Poston	50,635	9,758	19	50,635	11,409	23
Pine Creek	14,089	2,351	17	14,089	3,365	24
TOTAL	1,967,732	245,365	12	1,967,732	381,031	19

Allotment	Short-Term Trampling Under Proposed Action Total Acres*	Combined Acres**	% of Total	Long-Term Trampling Under Proposed Action Total Acres*	Combined Acres**	% of Total
Bar X	6,895	1,640	24	6,895	1,895	27
Fish Creek	7,237	1,743	25	7,237	1,989	27
Gold Creek	30,525	6,816	22	30,525	10,694	35
Little Sandy-Little Prospect	185,660	25,659	14	185,660	32,683	18
Steamboat Mountain	40,537	2,276	6	40,537	3,298	8
Little Colorado	726,956	81,908	11	726,956	125,460	17
Red Desert	245,375	32,980	13	245,375	38,091	16
Bush Rim	104,547	9,130	9	104,547	13,390	13
Continental Peak	88,478	11,544	13	88,478	13,396	15
Pacific Creek	202,856	18,199	9	202,856	23,222	11
Sands	114,852	5,484	5	114,852	10,337	9
White Acorn	46,794	10,255	22	46,794	10,602	23
Prospect Mountain	66,751	7,983	12	66,751	10,430	16
Reservoir	35,545	4,100	12	35,545	4,676	13
Poston	50,635	7,275	14	50,635	8,676	17
Pine Creek	14,089	1,786	13	14,089	2,550	18
TOTAL	1,967,732	228,778	12	1,967,732	311,389	16

* Allotment acres.

** The combined acres are the total of medium, severe, and heavy trampling. The percentage refers to the combined over the total acres.

TABLE 3-53

PROJECTED INCREASE IN ACRES USED BY LIVESTOCK BY ALLOTMENT UNDER PROPOSED ACTION

Allotment	Acres	% of Allotment	Allotment	Acres	% of Allotment
Bar X	415	6	Pacific Creek	17,067	8
Fish Creek	0	0	Sands	30,761	27
Gold Creek	333	1	White Acorn	7,112	14
Little Sandy-Little Prospect	16,670	9	Prospect Mountain	2,275	3
Steamboat Mountain	4,507	11	Reservoir	3,068	9
Little Colorado	58,865	8	Poston	8,280	16
Red Desert	13,422	5	Pine Creek	430	3
Bush Rim	8,349	8	TOTAL	180,766	10
Continental Peak	9,212	10			

TABLE 3-54

PROJECTED CHANGES IN ACRES WITH SEASONAL INTENSIVE LIVESTOCK USE UNDER PROPOSED ACTION

Allotment	Acres	Percent	Allotment	Acres	Percent
Bar X	-891	-12	Pacific Creek	16,026	8
Fish Creek	1,442	20	Sands	1,755	4
Gold Creek	3,095	11	White Acorn	10,721	20
Little Sandy-Little Prospect	-3,954	-5	Prospect Mountain	-1,360	-3
Steamboat Mountain	-997	-5	Reservoir	-972	-5
Little Colorado	38,253	8	Poston	1,651	-1
Red Desert	47,064	62	Pine Creek	1,014	8
Bush Rim	13,734	18	TOTAL	135,666	7
Continental Peak	9,085	13			

away from natural waters. Earthfill and pit reservoirs would destroy any site upon which they would be built, and the water developments would attract livestock to the area. Headcuts from reservoirs could destroy those portions of any site they cut through; of course, they could also expose buried sites which archeologists could record. The presence of reservoirs could slightly detract from the prehistoric environment and lessen the public's historic experience in the area.

The impact of cattle trampling upon known archeological sites which may be eligible for the National Register are listed in TABLE 3-55. These estimates were made by comparing the present cattle use with the proposed long-term cattle use. Sites which are in gently rolling terrain two miles away from water sources, such as the Eden-Farson Site, receive only light grazing pressure at the present time. In the future there would be some increased cattle pressure; however, trampling damage would be a low impact except in the Red Desert, Bush Rim, Continental Peak, and Pacific Creek Allotments and those areas around water sources.

Fences

The actual construction of fences would have a very minimal impact on sites. The vehicles used to construct the fence and construction activities would cause some churning of sites, which could alter or destroy artifacts. A moderate impact would occur from the creation of new trails for fence and water maintenance, which would damage sites due to vehicle use and lead to increased opportunities for vandalism of sites. Cattle congregating along fences would lead to moderate erosion of sites near the fences. Increased traffic around gates in fences would lead to severe erosion and exposure of archeological sites near them. The fences could infringe moderately on the prehistoric setting of the Sandy area and could decrease the public's historic experience in the area. Since there are no proposed projects in custodial management areas, there would be only minimal impacts to archeological resources from livestock trampling.

Historical

Trailing of large numbers of livestock along historic trails would eventually break down their berms and destroy vegetation in their vicinity, compromising the historic integrity of these trails. TABLE 3-56 shows proposed projects that would be located within one-fourth of a mile of the historic trails, or the estimated range within which the trail would be impacted. Locating salting stations within this one-quarter mile corridor would also result in heavy livestock concentration. These projects and heavy livestock concentration would have severe adverse impacts upon historical resources by disturbing historic remains or settings. None of the site-specific locations that are eligible for inclusion on the National Register would be affected by any of the proposed projects.

Impacts from the 31 fence crossings of the trails would vary, depending upon the condition of the trail. Historic trails in the Sandy area include ruts which have had almost no use for 70 years. Where gates or cattleguards are placed on well-preserved sections of the trails, increased traffic would be directed on to them, thereby causing severe degradation. Fence crossings would reduce the visual integrity of those trails where pristine ruts are still present (TABLE 2-63, TABLE 3-57, and MAP 3-2 located at the end of this chapter).

Summary of Impacts

Archeology

1. Grazing Systems.

a. Erosion could occur along livestock trails to water developments and along fences.

b. Increased trampling would lead to severe vertical and horizontal displacement of artifacts in the following allotments:

Little Sandy-Little Prospect, Steamboat Mountain, Farson and Big Sandy Use Areas of the Little Colorado, Red Desert, Bush Rim, Continental Peak, Pacific Creek, Sands, and Poston.

c. Wind erosion would lead to severe vertical displacement and increased vandalism.

d. Trampling would severely break and relocate artifacts in areas of heavy utilization, including areas where livestock trail. Land grazed by livestock would be significantly increased in the following allotments:

Continental Peak, Sands, White Acorn, and Poston.

e. Under the proposed seasonal use, the following allotments would have more intensive trampling, creating a more severe impact than the present:

Bar X, Fish Creek, Gold Creek, Red Desert, Bush Rim, Continental Peak, and White Acorn.

f. The impact of trampling upon specific known cultural sites during both the short and long terms could increase.

2. Grazing Treatments.

a. Treatment A would have the most severe impact.

b. Treatment B would have a medium impact.

c. Treatment C would have no impact on cultural values.

d. Treatment D would have a medium impact.

e. Treatment E would have a severe impact.

f. Livestock would detract from prehistoric environment.

3. Spring Developments. These could disturb or destroy any site associated with the spring by disturbing spatial context and affecting palynological profiles (see Glossary).

4. Wells. Construction activities could disturb or destroy any sites. JS-4 would be severely impacted.

5. Pipelines. Construction activities could destroy artifacts and seriously disturb their location as the tractor churns the site up and as the trench is dug. BF-1 could have its remaining deposits destroyed because of trampling resulting from having a stock trough placed upon it.

TABLE 3-55

TRAMPLING IMPACT ON KNOWN ARCHEOLOGICAL SITES

Site	Present	Future	Site	Present	Future
Finley	Medium	Heavy	FG-7	None	Heavy
Eden-Farson	Slight	Light	FG-4	Slight	Heavy
48SW305	Medium	Heavy	JS-4	Heavy	Severe
FG10	Heavy	Severe	BF-1	None	Severe
FG5	Medium	Severe			
EM-4	Light	Medium			
FG-9	None	Light			

TABLE 3-56

PROPOSED WATER DEVELOPMENTS NEAR HISTORIC TRAILS

Allotment	Trail	Type of Project	Location
Bar X	Oregon	Reservoir	NWNW S7T27N,R100W
Little Sandy-	Lander Cutoff	Reservoir	NENW S15T29N,R103W
Little Prospect	Lander Cutoff	Reservoir	SENE S25T29N,R103W
Little Sandy- Little Prospect	Lander-Pinedale	Reservoir	NWNW S26T28N,R103W
Little Colorado	Sublette Cutoff	Well	NWSE S9T26N,R108W
Continental Peak	Point of Rocks-South Pass Road	Reservoir	SWSE S4T26N,R100W
White Acorn	Lander Cutoff	Reservoir	SWNE S30T29N,R102W
White Acorn	Oregon	Reservoir	SESE S16T27N,R102W

TABLE 3-57

FENCE CROSSINGS OF HISTORIC TRAILS UNDER PROPOSED ACTION

Allotment	Location	Trail
Gold Creek	S35, T29N, R102W	Lander Cutoff
Little Sandy-Little Prospect	S4, T26N, R104W	Oregon Trail Sublette Cutoff Pony Express
Little Sandy-Little Prospect	S25, T27N, R103W	Oregon Trail Pony Express
Little Sandy-Little Prospect	S12, T28N, R104W	Lander-Pinedale Stage Road
Little Sandy-Little Prospect	S12, T28N, R104W	Lander-Pinedale Stage Road
Little Sandy-Little Prospect	S25, T28N, R103W	Lander-Pinedale Stage Road
Little Sandy-Little Prospect	S5, T29N, R103W	Lander Cutoff
Little Sandy-Little Prospect	S25, T30N, R104W	Lander Cutoff
Steamboat Mountain	S16, T24N, R101W	Point of Rocks-South Pass City Stage Road
Steamboat Mountain	S8, T23N, R101W	Point of Rocks-South Pass City Stage Road
Steamboat Mountain	S4, T23N, R111W	Kinney Cutoff
Little Colorado	S1, T22N, R110W	Kinney Cutoff
Little Colorado	S4, T26N, R109W	Sublette Cutoff
Little Colorado	S31, T23N, R109W	Slate Creek
Little Colorado	S35, T24N, R111W	Slate Creek
Little Colorado	S21, T22N, R107W	Bryan to South Pass City Stage Road
Little Colorado	S5, T22, R109W	Oregon Trail
Little Colorado	S15, T23N, R107W	Bryan to South Pass City Stage Road
Little Colorado	S32, T23N, R108W	Pony Express, Oregon Trail
Little Colorado	S6, T22N, R108W	Pony Express, Oregon Trail
Little Colorado	S8, T26N, R111W	Sublette Cutoff
Little Colorado	S14, 15, 16, T26N, R111W	Sublette Cutoff
Little Colorado	S4, T22N, R107W	Bryan to South Pass City Stage Road
Little Colorado	S36, T24N, R108W	Oregon Trail
Pacific Creek	S7, T26N, R103W	Bryan to South Pass City Stage Road
White Acorn	S32, T28N, R102W	Lander-Pinedale Stage Road
Prospect Mountain	S27, T30N, R105W	Lander-Pinedale Stage Road
Prospect Mountain	S11, T29N, R105W	Lander-Pinedale Stage Road
Prospect Mountain	S16 & 24, T30N, R105W	Lander Cutoff
Prospect Mountain	S19, T30N, R104W	Lander Cutoff
Reservoir	S11, T26N, R106W	Sublette Cutoff

6. Reservoir Construction. This could destroy any sites upon which a reservoir were built, and trampling around the reservoir could seriously impact sites nearby. Two specific sites could be affected by trampling. If headcuts are created, they could severely impact any sites where they occur. This would also slightly detract from the prehistoric environment.

7. Fences.

a. Vehicles used in construction would cause minimal churning of soil exposing sites.

b. New trails would lead to moderate damage and increased vandalism.

c. Cattle would create trails along the fences, causing moderate damage.

d. Increased traffic around gates would lead to exposure of sites, leading to severe damage by vandalism and trampling.

e. Livestock would moderately interfere with the prehistoric setting of the area.

Historical

1. Wells and reservoirs would disturb historic trail remains or settings.
2. Livestock trailing along historic trails would break down berms and cause damage to the trail.
3. Fences crossing trails would increase visual intrusion and cause an impact to the visual integrity of the site.

VISUAL RESOURCES

The visual impacts of the proposed action are site-specific and are related to water project developments, fencing, and concentrated trampling in stream bottoms and around water developments. For the most part these impacts currently exist throughout the landscape and represent a commonly occurring visual effect. Change in the visual resource for the area, as a whole, would be very minimal.

Analysis of visual impacts was accomplished by isolating the "worst case"in a landscape type for each type of proposed range improvement or combination of proposed improvements. If the "worst case"was found to be within the objectives for the visual resource, it was presumed that all other cases would be within acceptable limits. If the "worst case"was not within acceptable limits, the next "worst case"was examined until a case within acceptable limits was found. The methods used to determine visual contrast ratings are shown in APPENDIX 2K. The projects were examined using the contrast rating system (BLM Manual 6320). The contrast ratings for the worst contrast of a feature, that is a composite of the highest contrast for land, the highest contrast for vegetation, and the highest contrast for structures, regardless of site or type of improvement, are shown on TABLE 3-58.

It should not be construed that the entire area would be uniformly affected as shown on TABLE 3-58. The area as a whole may be considered to be affected to a lesser degree than shown.

Aesthetics

The visual quality of the Sandy area would decline in the eyes of a segment of the population because of the introduction of additional fencing. The visual impact of fencing would be very minimal; nonetheless, a public reaction could be anticipated because of the strong desire for wide open spaces. This reaction would be less aesthetic than a reflection of the values of the local public.

The aesthetic impact of fencing is considered negligible except where foreign vertical elements, such as the fence posts, are highlighted against the sky, disrupting the natural lines of the ridges. Because of the limited access and the extent of fencing proposed in the Sandy area, this situation would rarely be observed.

Range Improvements

Four areas have been identified as being significantly impacted; they are cases where the visual contrast exceeds the visual resource management class objective. Two reservoirs are located in the Honeycomb Buttes Landscape Type within the Continental Peak Allotment. The major visual effect would be a change in land/water form, and it would be primarily an effect of trampling and the fact that the critical viewpoint would be above the proposed developments, making them highly visible.

Construction of a well with associated pipelines and stock tanks and related trampling of vegetation would significantly reduce the visual quality within the Sands Allotment near the Boars Tusk Sand Dunes Landscape Type. These facilities would also add structures which conflict with the natural character of the landscape. This development would be adjacent to a highly traveled road, rendering these features highly visible. The Steamboat Mountain-Red Desert allotment boundary fence in the Jack Morrow Rims Landscape Type would be skylined and visible from the adjacent road.

NATURAL LANDMARKS

Natural landmarks would be impaired by those manmade features that resist rehabilitation. One of the potential landmarks identified previously, Steamboat Mountain, would be affected by the checkerboard fencing. The other landmarks identified previously would be affected only by grazing.

Steamboat Mountain is not a designated area. If designated, the checkerboard fence could be removed or relocated and rehabilitated to a natural state. The potential for designation of this landmark would, therefore, remain unimpaired. Grazing effects on this and other natural landmarks is a historic use. The disposition of grazing, both current and historic disposition in terms of natural

TABLE 3-58

"WORST CASE" VISUAL CONTRAST RATINGS UNDER PROPOSED ACTION*
Significant Impacts Are Circled

			Land/Water						Vegetation						Structures				
Allotment	Landscape Type	Visual Objective Class	Form	Line	Color	Texture	Total		Form	Line	Color	Texture	Total		Form	Line	Color	Texture	Total
Bar X	Continental Peak	III			1	1	3	pit[1/]			1	1	3	pit[1/]	1	2	2		14 fence
		IV			1	1	3	pit			1	1	3	pit	1	2	2		14 fence
		III			2	2	6	pit			2	2	6	pit		2	1		8 pit
		IV			2	2	6	pit			2	2	6	pit		2	1		8 pit
Fish Creek											2	2	6	pit		2	1		8 pit
	South Pass	II			2	2	6	pit							1				
Gold Creek											1	1	3	earth-fill		1	1		9 earth-fill
	Wind River Front	II			1	1	3	earth-fill[1/]											
	South Pass	II			2	2	6	pit			2	2	6	pit		2	1		8 pit
Little Sandy-Little Prospect	Colorado-Sandy	III		2	2	1	11	earth-fill	1		2		14	pit	1	1	2	1	12 well
		IV		2	2	1	11	earth-fill	1	2	2		14	pit	1	1	2	1	12 well
	Prospect	IV	1		2	2	10	earth-fill		1	2	2	9	earth-fill	1	1			7 earth-fill
	Elk Mountain	IV														1			7 fence
	Prospect Mountain	II	1		2	2	10	earth-fill	1			2	10	earth-fill	1	1	1	1	10 earth-fill
		III	1		2	2	10	earth-fill	1		2	2	10	earth-fill	1	1	1	1	10 earth-fill
	Wind River Front	II			1	1	3	earth-fill			1	1	3	earth-fill	1	1	1		9 earth-fill
		III			1	1	3	earth-fill			1	1	3	earth-fill	1		2		8 well
Steamboat Mountain	Red Desert	III		2	1		8	well		2	1		8	well	1		2		8 well
	Boars Tusk	III	1		2		8	pit		1	1	1	6	stock-tank	1	2			10 fence
	Jack Morrow	IV	2		2	2	14	earth-fill	1		2	2	10	earth-fill	1	2	1	1	13 pit
	Rims	III			2	2	6	pit			2	2	6	pit	2	3[2/]			17[2/] fence
Little Colorado Green River Use Area	Colorado-Sandy	IV		2	2	1	11	earth-fill	1	2	2		14	pit	1	1	2	1	12 well
	Green River vicinity	II			1	1	3	fence			2	1	5	fence	1	1	1		fence
	LaBarge vicinity	V													2	3[2/]	3[2/]	1	24[2/] fence
Farson Use Area	Colorado-Sandy	III		2	2	1	11	earth-fill	1	2	2		14	pit	1	1	2	1	12 well
		IV		2	2	1	11	earth-fill	1	2	2		14	pit	1	1	2	1	12 well
Big Sandy Use Area	Colorado-Sandy	III		2	2	1	11	earth-fill	1	2	2		14	pit	1	1	2	1	12 well
		IV		2	2	1	11	earth-fill	1	2	2		14	pit	1	1	2	1	12 well
	Sublette Flat	III		2	1	2	10	well		2	2	1	11	well	1	2	2		14 well
		IV		2	1	2	10	well		2	2	1	11	well	1	2	2		14 well
Red Desert	Red Desert	III		2	1		8	well		2	1		8	well	1		2		8 well
	Honeycomb Buttes	II			2	1	3	fence			2	1	3	fence			2	1	3 fence
	Red Desert Sand Dunes	III	NO IMPROVEMENTS VISIBLE FROM CRITICAL VIEWPOINTS																
	Pinnacles	III	NO IMPROVEMENTS VISIBLE FROM CRITICAL VIEWPOINTS - NO CHANGE IN THIS AREA																
	Continental Peak	IV			1	1	3	pit			1	1	6	pit	1	2	2		14 fence
	Rims	III			2	2	6	pit			2	2	6	pit	1	1			7 fence
Bush Rim	Red Desert	III		2	1		8	well		2	1	1	3	fence	1		2		8 fence
	Honeycomb Buttes	II			2	1	3	fence			2	1	3	fence			2	1	3 fence
	Continental Peak	IV			1	1	3	fence			1	1	3	fence	1	2	2		14 fence
	Jack Morrow	IV	2		2	2	14	earth-fill	1		2	2	10	earth-fill	1	2	1	1	13 pit
	Rims	III			2	2	6	pit			2	2	6	earth-fill	1	1			7 fence
	Oregon Buttes	II														2			6 fence

TABLE 3-58 (Continued)

"WORST CASE" VISUAL CONTRAST RATINGS UNDER PROPOSED ACTION*
Significant Impacts Are Circled

Allotment	Landscape Type	Visual Objective Class	Land/Water Form	Land/Water Line	Land/Water Color	Land/Water Texture	Land/Water Total		Vegetation Form	Vegetation Line	Vegetation Color	Vegetation Texture	Vegetation Total		Structures Form	Structures Line	Structures Color	Structures Texture	Structures Total
Continental Peak	Red Desert	III		2	1		8	well		2	1		8	well	1		2		8 well
	Honeycomb Buttes	II	1	1	2	2	13 2/	earthfill			2	1	5	earthfill	1	1			7 fence
	Colorado-Sandy	III		2	2	1	11 2/	earthfill	1	2	2		14	pit	1	1	2	1	12 well
		IV		2	2	1	11 2/	earthfill	1	2	2		14	pit	1	1	2	1	12 well
	Continental Peak	III			1	1	3	pit			1	1	3	pit	1	2	2		14 fence
		IV			1	1	3	pit			1	1	3	pit	1	2	2		14 fence
	Jack Morrow	IV	2		2	2	14	earthfill	1		2	2	10	earthfill	1	2	1	1	13 fence
	South Pass	III			2	2	6	pit			2	2	6	pit		2	1		8 pit
		IV			2	2	6	pit			2	2	6	pit		2	1		8 pit
Pacific Creek	Colorado-Sandy	III		2	2	1	11	earthfill	1	2	2		14	pit	1	1	2	1	12 well
		IV		2	2	1	11	earthfill	1	2	2		14	pit	1	1	2	1	12 well
	Prospect	III	1		2	2	10	earthfill		1	2	2	9	earthfill	1	1			7 earthfill
	Boars Tusk	III	1		2		8	pit		1	1	1	6	stock-tank	1	2			10 fence
	Boars Tusk-Sand Dunes	III	1	1	1	1	10	well		2	2	2	12 2/	pipeline	2		2		12 2/ pipeline
	Continental Peak	IV			1	1	3	pit			1	1	3	pit	1	2	2		14 fence
	Jack Morrow	III	2		2	2	14	earthfill	1		2	2	10	earthfill	1		1	1	13 fence
		IV	2		2	2	14	earthfill	1		2	2	10	earthfill	1	2	1	1	13 fence
	Oregon Buttes	II														2			6 fence
	South Pass	III			2	2	6	pit			2	2	6	pit		2	1		8 pit
		IV			2	2	6	pit			2	2	6	pit		2	1		8 pit
Sands	Colorado-Sandy	II	NO CHANGE IN CLASS II AREA																
		III		2	2	1	11	earthfill	1	2	2		14	pit	1	1	2	1	12 well
	Boars Tusk	II	1		2		8	pit		2	2	1	11 2/		1	2			10 fence
		III	1		2		8	pit							1	2			10 fence
	Boars Tusk-Sand Dunes	II	1	1	1	1	10	well		2	2		12 2/		2		2		12 2/ well
White Acorn	Colorado-Sandy	III		2	2	1	11	earthfill	1	2	2		14	pit	1	1	2	1	12 well
	Prospect	III	1		2	2	10	earthfill		1	2	2	9	earthfill	1	1			7 earthfill
		IV	1		2	2	10	earthfill			1	2	4	earthfill	1	1			7 earthfill
	Wind River Front	II			1	1	3	earthfill			1	1	3	earthfill	1	1	1		9 earthfill
	South Pass	II			2	2	6	pit			2	2	6	pit		2	1		8 pit
Prospect Mountain	Colorado-Sandy	III		2	2	1	11	earthfill	1	2	2		14	pit	1	1	2	1	12 well
		IV		2	2	1	11	earthfill	1	2	2		14	pit	1	1	2	1	12 well
	Prospect	III	1		2	2	10	earthfill		1	2	2	9	earthfill	1	1			7 earthfill
		IV	1		2	2	10	earthfill		1	2	2	9	earthfill	1	1			7 earthfill
	Elk Mountain	IV													1	1			7 fence
	Prospect Mountain	II	1		2	2	10	earthfill	1		2	2	10	earthfill	1	1	1	1	10 earthfill
	Wind River Front	II	1		1	1	3	earthfill			1	1	3	earthfill	1	1	1		9 earthfill
		III			1	1	3	earthfill			1	1	3	earthfill	1	1	1		9 earthfill

TABLE 3-58 (Continued)

"WORST CASE" VISUAL CONTRAST RATINGS UNDER PROPOSED ACTION*
Significant Impacts Are Circled

Allotment	Landscape Type	Visual Objective Class	Land/Water Form	Land/Water Line	Land/Water Color	Land/Water Texture	Land/Water Total		Vegetation Form	Vegetation Line	Vegetation Color	Vegetation Texture	Vegetation Total		Structures Form	Structures Line	Structures Color	Structures Texture	Structures Total	
Reservoir	Colorado-Sandy	III		2	2	1	11	earth-fill	1	2	2		14	pit	1	1	2	1	12	well
		IV		2	2	1	11	earth-fill	1	2	2		14	pit	1	1	2	1	12	well
	Prospect	III	1		2	2	10	earth-fill		1	2		9	earth-fill	1	1			7	earth-fill
Pine Creek	South Pass	II			2	2	6	pit			2	2	6	pit		2	1		8	pit

*See APPENDIX 2K for methods used to determine visual contrast ratings.

1/ Pit or earthfill reservoir.

2/ Honeycomb Buttes = 2 earthfill reservoirs do not meet the objective class. The next "worst case" is a fence which does meet the objective class in this landscape type with a rating 0, 0, 2, 1, 5.

LaBarge = Same as existing due primarily to oil and gas development in LaBarge vicinity. Effect of fence is negligible by comparison.

Boars Tusk = Pipeline crosses road in vicinity of sand dune rally area. The next "worse case" is a pit reservoir and well which does meet the objective class in this landscape type with rating 0, 1, 1, 1, 6.

Boars Tusk Sand Dunes = Same pipeline as above and a well related to the pipeline. The next "worse case" for vegetation is the same pipeline from a location near the well with an acceptable contrast rating of 0, 0, 2, 1, 3. The next "worse case" for "structures" is a fence with a rating within the objective management class of: 4, 3, 0, 0, 7.

Jack Morrow Rims = Skylined fence near road. The next "worse case" for structures is the same fence where not skylined with a contrast rating of 1, 1, 0, 0, 7.

landmarks has not been determined and therefore no impact can be identified.

RECREATION RESOURCES

Assumptions

Site-specific recreation experiences would change in quality in the Sandy area. The desirability of sites for recreation would increase or decline and would influence visitor use expressed as visitor days. Factors identified within the proposed action which would influence visitor use are: (1) livestock trampling and accumulation of feces making sites less desirable; (2) the growth and development of willow on streambottoms which may inhibit access to streambottoms; and (3) impeded access by fencing.

Some individuals would tolerate the same site under poorer conditions than others. Those who would not tolerate certain site conditions would go elsewhere. The change in visitor day use is based on this movement. Movement may be to or from adjacent National Forest lands or may be a shift of use between allotments within the Sandy area.

An increase in various recreation uses throughout the Sandy area would result in additional secondary impacts to the environment. It is assumed that a dramatic increase of visitor use and the problems associated with increased recreation use would be identified and appropriate actions would follow to solve these problems, thus preventing further impacts such as reduced water quality.

Impacts

Visitor use figures are shown in TABLE 3-59. Reductions in visitor day use are more accurate than increased visitor use because improvement in site characteristics would not necessarily generate an increased demand to use the sites, while significant deterioration of sites through factors listed in assumptions would likely reduce use. It is assumed that visitors traditionally using a specific site within the Sandy area would most likely move to another site within the Sandy area if the quality of their experience at their favorite site was reduced.

TABLE 3-60 indicates the estimated change in visitor use, between the existing situation and that which would occur under the proposed action. A more detailed analysis is available for review upon request from the Rock Springs District Office.

Visitor use would also vary indirectly with the base resource in the case of hunting and fishing. Hunter and fisherman days would fluctuate according to the number of permits issued. The quality of the hunting and fishing experience would decrease as hunting and fishing success decreases.

Hunter days and consequently visitor use generally have an inverse relationship to animal numbers. It is possible to increase the number of hunter days though reducing the number of animals and permits issued; fewer animals implies a longer period of time for the hunt. The change in hunter days cannot, therefore, be projected on the basis of the change in animal population.

The following ranges are provided to define the probability of occurrence of impacts.

Minimal—Accidents not likely to occur.

Moderate—Accidents could occur but would not be common.

Significant—Accidents are likely to occur.

Proposed fences would moderately increase the hazard to snowmobile and floatboating users. They would minimally increase the hazard to cross-country skiers. Those with experience would be aware of the hazard, although novices may not be. In an encounter with a fence, the danger to snowmobile operators is severe; the danger to floatboaters is moderate to severe; and the danger to cross-country skiers is slight. Fences are not prevalent in the areas where these activities are most common, hence few accidents should occur. It is probable that any accident involving floatboaters and snowmobile users would be serious.

Concentrations of domestic and wild animals would be more likely to transmit zoonotic diseases and parasites to people and their pets. For example, campers who use unsterilized water could contract leptospirosis from carrier deer or cattle even after the animals have departed the area (Buchanan 1951). The potential hazard to recreation users of the area cannot be quantified because of lack of data.

Proposed livestock water developments in heavily used recreation areas could present the opportunity to provide water to recreation users. This would improve the recreation experience by an undetermined amount.

Summary of Impacts

The proposed action would substantially increase visitor use of the Sandy area as shown on TABLE 3-60. In addition to these changes, the visitor use in hunting would vary indirectly with changes in wildlife habitat because hunting licenses are essentially used as a wildlife management tool and are not directly related to recreation demand.

Fences would increase the hazard to snowmobile users, floatboaters, and cross-country skiers. The hazard involved and the number of accidents cannot be determined at this time but are estimated to be minimal.

Wilderness Resource

The potential impacts to the wilderness resource include surface disturbance, destruction of vegetation, soil compaction, and visual contrasts to the landscape. These impacts would result from the construction and maintenance of proposed improvements such as roads, fences, and water projects. Reclamation and rehabilitation of dis-

TABLE 3-59

RECREATION VISITOR DAYS PER YEAR BY ACTIVITY IN EACH ALLOTMENT UNDER THE PROPOSED ACTION*

Activity	Bar X	Fish Crk	Gold Crk	LS-LP	Steamboat Mtn	Little Colo	Red Desert	Bush Pim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mtn	Reservoir	Poston	Pine Crk	Total Visitor Days
Sand Dune Rally											3,700						3,700
Recreation Vehicle			360	241	139		805	68	35	117	124	189	428			15	2,521
Camping Trailer	622	74	15,404	8,485	46	3,059		440	630	755		8,626	6,584	1,746	964	46	47,481
Dry Camp-Tent	32	4	813	403		201						599	347	56	30	3	2,488
Tent	110	13	3,041	1,511		1,296			7			1,536	1,235	691	360	9	9,809
Picnic Dry Camp	11	2	50	60							67	31				2	223
Picnic	67	26	579	771					30			252		250		18	1,993
Camping-Camping Areas			1,600			43,755						100	933	78,750		100	125,238
Picnic-Picnic Areas			725			495						45	449			45	1,759
Hunting																	
Moose	1	1	1						1			1	6	4	4		19
Elk	1	20	394	35	22			37		12	7	81	150	4	41	30	834
Deer	2	3	60	119	37	224	10	62	9	19	17	71	172	7	74	4	890
Antelope	3	6	4	10	12	82	236	28	46	13	21	3	2	3	5	1	475
Grouse			9	2					46			6	7				70
Sage Grouse	29	25	675	2,818	68			95		360		1,527	884			5	6,486
Dove			5		15					46	35			7	4	2	114
Goose/Duck						697								81			778
Cottontail						251					146						397
Rock Collecting	335			412	14	700		225	273	231				48			2,238
Fishing-Stream	30	42	6,407	4,488					43			3,987	6,570	2,017	1,500	34	25,118
Floatboat-Canoe	117	33	228	163		1,230			17			149	351	236	806		3,330
Fishing-Reservoir						7,679								842			8,521
Boating						1,100								248			1,348
Waterskiing						70								128			198
Swimming						132								8			140
Snow Play	56	56	222									28				139	501
Cross-Country Skiing			92	2								15					109
Snowmobile			111			34					411	189					745
Sightseeing-Highway	60		180	210		946				752	705	180		598	230	133	3,994
Sightseeing-General	85	28	967	2,686	686	611	549	419	395	80	1,600	2,397	3,467	10,186		22	24,178
ALLOTMENT USE TOTAL	1,561	333	31,927	22,416	1,039	62,562	1,600	1,374	1,532	2,385	6,833	20,012	21,585	95,910	4,018	608	275,695

No figures available for hiking, backpacking, and horseback riding.

*Visitor days per year resulting from factors identified in the assumptions.

TABLE 3-60

PERCENT INCREASE OR DECREASE* OF RECREATION VISITOR USE
AFTER IMPLEMENTATION OF THE PROPOSED ACTION

Activity	Bar X	Fish Creek	Gold Creek	LS-LP	Steamboat	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mtn	Reservoir	Poston	Pine Creek	Total Area
Sand Dune Rally											N.C.						N.C.
Recreation Vehicle			N.C.	-70%	-50%		N.C.	N.C.	N.C.	-50%	-50%	-40%	-40%		+100%	N.C.	-35%
Camping-Trailer	N.C.	+25%	+25%	+25%	+59%	+60%		N.C.	N.C.	+25%		N.C.	+25%	+100%	N.C.	N.C.	+23%
Dry Camp-Tent	-18%	N.C.	+6%	-5%		+90%						+11%	+5%	N.C.	N.C.	N.C.	+8%
Tent	-5%	+18%	+32%	+19%		+306%			N.C.			-5%	+25%	+321%	+300%	N.C.	+42%
Picnic-Dry Camp	+38%	N.C.	+11%	N.C.							N.C.	+11%				N.C.	+5%
Picnic	-7%	+44%	+43%	+43%					N.C.			N.C.		+150%		N.C.	+39%
Camping-Camping Areas			+33%			+605%						N.C.	+33%	+900%		N.C.	+692%
Picnic-Picnic Areas			+33%			+650%						N.C.	+33%	+900%		N.C.	+62%
Hunting-Moose	N.C.	N.C.	N.C.						N.C.			N.C.	+100%	+100%	+100%		+58%
-Elk	N.C.	N.C.	-10%	-10%	+10%		N.C.		N.C.	N.C.	N.C.	-10%	+10%	N.C.	N.C.	N.C.	
-Deer	N.C.	N.C.	N.C.	-10%	+12%	+11%	N.C.	N.C.		N.C.	N.C.	-10%	-10%	+17%	N.C.	N.C.	-2%
-Antelope	N.C.	+20%	N.C.	-9%	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	N.C.	-17%	N.C.	N.C.
-Grouse			+13%	N.C.					N.C.			N.C.	+17%				-58%
-Sage Grouse	N.C.	+14%	+32%	+11%	+42%			N.C.		+11%		+25%	+47%			+25%	+21%
-Dove			N.C.		+25%					+12%	+9%			+75%	+100%	N.C.	+16%
-Goose/Duck						+113%								+72%			+107%
-Cottontail						+43%											+29%
Rock Collecting	N.C.			N.C.	N.C.	+100%		N.C.	N.C.	N.C.				N.C.			+18%
Fishing-Stream	N.C.	+24%	+13%	+25%					N.C.			N.C.	+150%	+144%	+200%	N.C.	+44%
Floatboating-Canoe	N.C.	N.C.	+5%	-6%		+19%			N.C.			-1%	+17%	+18%	+271%		+35%
Fishing-Reservoir						+11%							+11%				
Boating						N.C.								N.C.			N.C.
Waterskiing						+13%								+25%			+20%
Swimming						N.C.								N.C.			N.C.
Snow Play	N.C.	N.C.	N.C.									N.C.				N.C.	N.C.
Cross-Country Skiing			-11%	N.C.								-25%					-13%
Snowmobile			-5%			-13%					N.C.	-14%					-5%
Sightseeing- -Highway	N.C.		N.C.	N.C.		N.C.				N.C.	N.C.	N.C.		N.C.	N.C.	+11%	N.C.
-General	N.C.	-40%	-40%	-40%	-11%	-11%	N.C.	N.C.	N.C.	-20%	-27%	-27%	-25%	N.C.		N.C.	-17%
TOTAL ALLOTMENT USE	-1%	+6%	+18%	+4%	-15%	+208%	N.C.	N.C.	N.C.	+2%	-7%	-3%	+28%	+335%	+107%	+2%	+86%

*Change in use pattern. Note: Hunting will also vary in an indirect relationship to the population of animals involved. Hunting use is more directly related to human population changes in the community than anything.

**Changes in recreation visitor days resulting from the factors assumed at the beginning of this section.
N.C. = No Change.

turbed areas would require intensive efforts to return the land to a natural state and thus may preclude use of an area for wilderness purposes. Where these potential impacts exist, implementation of those components of the proposed action would be postponed until the studies and public meetings required under the Federal Land Policy and Management Act of 1976 (FLPMA) have been completed.

LIVESTOCK GRAZING

Assumption

The range would be used at full grazing capacity once the AMPs are implemented. Nonuse that is not necessary for conservation and protection of the range would be made available to other range users so that maximum production can be obtained from the resource.

Impacts on Livestock

Grazing Systems

The proposed grazing systems should result in improved range conditions, increased vigor of the preferred forage species, and increased forage production, which should result in improved livestock condition and production. Over the short term, livestock condition and production should improve as the range improves and cattle adjust to new grazing practices. Improved range conditions should also result in increased weight of calves and lambs at the end of the grazing season. Quantification cannot be predicted until better data is gathered, which would have to be supplied by the permittees. Some additional stress may be experienced by livestock due to increased levels of use supervision (herding) as required by the proposed action.

Forage production available for livestock should increase over the long term by 11% from 150,288 (TABLE 2-70) to 166,550 AUMs (TABLE 3-61). The treatments prescribed with the rest-rotation and deferred grazing systems would result in specific impacts. These impacts are discussed in detail by treatment in the following paragraphs.

Grazing Treatments

Treatment A (graze season long) allows livestock to remain in the pasture the entire grazing season or until the deferred pasture is opened. Cattle are allowed to move freely between pastures without forced movement if desired by permittees. Since cattle would be confined to one-fourth to one-half of the area within an allotment that they normally use, there should be an increase in the likelihood of a cow being serviced by a bull. Cattle would be confined in one pasture for at least one heat period (every 21 days). A mixture of last year's forage and green forage should allow cattle to adjust to their new diets and reduce the incidence of scours and initial weight loss (Gossard and Juergenson 1971). Holding livestock in one pasture would force them to spread out over the pasture, utilizing lightly grazed steeper slopes and less preferred forage. This assumes that terrain, steep slopes, and water distribution does not limit or restrict livestock use of some areas. This treatment encompasses the growing season when plants have a high nutritive value and should produce the greatest livestock gain at that time.

Treatment B (rest until seedripe, then graze) requires the livestock to come into a pasture of mature forage which would be somewhat less palatable and to some extent less nutritious (Morrison 1961). Livestock rate of weight gains would decrease as the season progresses and they may be only maintaining their weight by the end of the latest grazing season. In the Steamboat Mountain, Gold Creek, and Bar X Allotments, where the cattle are herded to pastures under this treatment, there could be a weight loss until they adjust to the grazing area (Hormay 1970).

Treatment C (rest season long) would not impact livestock except indirectly since this is where there is an increase in forage, plant vigor, and seedling establishment. All allotments except Steamboat Mountain and Bar X Allotments would have year-long rest on a portion of the allotment.

Treatment D (rest until peak of flowering, then graze) pertains only to the Bar X Allotment. This is similar to Treatment B except grazing begins earlier, while the plants are more palatable and nutritious. Livestock should be making better weight gain at the beginning of this treatment than with Treatment B. This treatment also requires a forced move, which would result in reduced weight gains until the livestock adjust.

Treatment E (graze until seedripe, then rest) would have essentially the same impacts early in the season as Treatment A. It would then be terminated with a forced move, which would result in reduced weight gains until the livestock adjust.

Range Improvements

Water. In the Red Desert, Bush Rim, and Continental Peak Allotments and the Farson Use Area of the Little Colorado Allotment, where rotation is based on control of waters, cattle would have to be herded and shown available waters at least the first year (Martin and Ward 1970). Forced movement would result in stress on the animals and temporary reduced weight gains until they become adjusted to the new areas, water locations, and new diets.

By increasing the number of water developments, sheep and cattle would be able to graze areas previously unavailable because they were too far from water. By making more forage readily available with water nearby, livestock would spend less time traveling, thus saving energy that could be used in weight gains or in milk production for their young. These factors are important to

TABLE 3-61

ACTIVE AUMS OF USE AVAILABLE TO LIVESTOCK UNDER PROPOSAL

Allotment	Presently1/	Short Term2/	Long Term3/
Bar X	955	879	1,044
Fish Creek	900	888	1,038
Gold Creek	3,828	3,521	5,490
Little Sandy- Little Prospect	16,743	12,612	16,700
Steamboat Mountain	2,369	1,710	2,320
Little Colorado	50,189	43,395	63,233
Red Desert	19,502	16,725	19,700
Bush Rim	6,922	5,820	7,100
Continental Peak	7,694	6,553	7,220
Pacific Creek	14,386	11,664	14,670
Sands	5,773	4,050	5,390
White Acorn	5,517	5,384	5,695
Prospect Mountain	6,739	4,684	7,790
Reservoir	2,685	2,352	2,845
Poston	4,615	3,708	4,790
Pine Creek	1,471	1,124	1,525
TOTAL	150,288	125,516	166,550

1/From TABLE 2-70; total of actual use total column and nonuse total column.

2/From TABLE 1-4.

3/From TABLE 3-15; combined long-term cattle and sheep use.

the livestock operator as his major purpose in the livestock business is to produce as many calves as possible with the heaviest weights possible under given range conditions.

Fences. Except in the Red Desert, Bush Rim, and Continental Peak Allotments and the Farson Use Area of the Little Colorado Allotment, fences would hold livestock to the grazing treatments and, along with the proposed water developments, provide better distribution over the allotment. Since cattle are not herded, they could tend to congregate where fences cross drainages and other movement paths. They would mill about or trail along the fence trying to get around it. This would waste energy and could eventually reduce weight gains or lower the animals' condition. Fences would have a minor impact on herded sheep.

Impacts on Permittees

The total of 144,885 AUMs available on NRL at the start of the program, including trailing (TABLE 1-4), would be a 17% reduction from the current permitted NRL use of 138,047 AUMs, which includes authorized nonuse (TABLE 2-70). However, the actual active use of 85,771 AUMs would be increased by 29,114 AUMs (total: 144,885) as current nonuse would be activated. As a result of the proposed action, there is a potential of 166,550 AUMs to be made available to permittees over the 23-year period (TABLE 3-61). The effects of loss of AUMs and converting from sheep to cattle are discussed in the socioeconomic section.

The Little Sandy-Little Prospect, Pacific Creek, White Acorn, and Prospect Mountain Allotments would have later entering dates (May 16) in the spring than are currently allowed (May 1). This would affect 24 cattle operators and 4 sheep operators. Two operators with horse licenses would also be affected. For the permittees who winter cattle and horses on their irrigated ranch property, the two-week delay in opening dates would require holding their stock on private land. The livestock would then utilize forage growth normally harvested for hay. This would reduce by an estimated 6,000 tons the amount of hay produced to carry the stock the following winter. Permittees would either have to reduce this base herd or purchase additional hay to feed this herd.

There would be more of an impact on the permittee who winters his cattle on checkerboard lands. Since the checkerboard is roughly 53% private land used as parallel base (see Glossary), these operators are wintering on their base land and would have to purchase additional pasture or reduce their livestock numbers to stay the extra time on the checkerboard. Whether or not the checkerboard could be utilized in this manner has not been analyzed.

There could be an impact on those permittees where herding would be used to control livestock use. They would have to hire additional laborers to herd or control the livestock in accordance with proposed grazing systems. Their ability to pay for this additional use could be limited and/or there could be no labor force of individuals willing to do this type of work. This could force these individuals to sell their livestock or to put their operation up for sale.

There would also be an impact on all permittees who traditionally lamb in the Sandy area. Movement of bands between May 1 and May 15 would mean lambing on the trail, stressing pregnant ewes, possible increased abortions and higher lamb mortality. Delaying lambing another two weeks would mean lighter, younger market lambs and poorer conception rates in ewes. Some operators would experience difficulty in lambing in different pastures each year due to the reluctant difficulty of coordinating shearing and lambing activities.

Projects and Use Supervision

The impact of increased supervision on the permittee as a result of the proposed action cannot be quantified at this time. There would be three areas requiring more supervision of livestock: (1) required pasture moves, (2) maintaining distribution of stock where they congregate in small areas, and (3) removing stock from closed pastures. There would be increased maintenance of projects, primarily fences, that do not now exist, which would involve labor and equipment (TABLE 3-62). Cost to the ranchers would be $91,210 on projects they would maintain. One study indicated the cost of rest-rotation grazing to an existing cattle operator was 9% more annually (Ratliff et al. 1972).

The added amount would vary with each operator based on his current and proposed operations. Sheep operators presently fully stocked and proposing to continue with sheep use would require no additional manpower for supervision. Added expense would be incurred by sheep operators as they would be required to contribute to the maintenance of proposed range improvements. On the other hand, a sheep permittee taking total or partial nonuse and proposing to convert to cattle would require additional manpower for supervision and have an increased cost of project maintenance. The existing cattle and cattle-sheep operations could need additional manpower for increased supervision, as well as having increased maintenance responsibilities. Those permittees in the Red Desert, Bush Rim, and Continental Peak Allotments and Farson Use Area of the Little Colorado Allotment would have less fence maintenance responsibilities since there are no interior fences proposed. In the proposed fenced allotments, confinement of the livestock could make observation and supervision easier for the permittee. BLM use supervision would increase to assure compliance with the proposed AMPs (Chapter 1). This would require the hiring of an additional five people to insure compliance with the proposed grazing systems.

Custodial Management

Custodial management should have minimal impacts on the permittees for the most part since they would still have flexibility in the way they use the pastures. They can use the pastures to separate and treat sick stock, for

TABLE 3- 62

INCREASED COSTS TO OPERATORS FOR ANNUAL MAINTENANCE OF PROJECTS UNDER THE PROPOSED ACTION

Allotment	Proposed Water Projects Wells	Springs	Pipelines	Proposed Fences 3-Wire	4-Wire	Totals
Gold Creek	-	-	-	-	1,600	1,600
Little Colorado-Little Prospect	-	-	-	-	11,680	11,680
Steamboat	-	-	-	4,500	-	4,500
Little Colorado	4,800	-	450	10,800	15,200	31,250
Red Desert	-	-	-	5,250	-	5,250
Bush Rim	-	-	-	1,950	-	1,950
Continental Peak	-	-	-	450	-	450
Pacific Creek	400	-	250	7,800	-	8,450
Sands	400	750	100	9,000	-	10,250
White Acorn	-	-	-	-	3,200	3,200
Prospect Mountain	-	250	-	-	6,080	6,330
Reservoir	-	-	-	-	2,240	2,240
Poston	-	250	200	-	2,400	2,850
Pine Creek	-	250	-	-	960	1,210
TOTAL COSTS	$5,600	$1,500	$1,000	$39,750	$43,360	$91,210

special breeding practices, or as holding pastures. However, Pasture C-28 in the proposal would have a fence removed and 1,389 acres of NRL would be placed in the Prospect Mountain Allotment. The remaining 80 acres of Pasture C-28 would still be managed as a custodial pasture. The Buckskin-Sandy Pasture would also be included in the Prospect Mountain Allotment, eliminating 7,365 acres of NRL from custodial management.

No Grazing

The Palmer Draw area would be excluded from livestock use. The impact on the permittee from removing 970 acres from livestock grazing in the Gold Creek Allotment should be minimal. The range survey indicated approximately 148 AUMs of forage in the area; however, all of these could not be used by cattle because of the rockiness and steepness of the slopes.

Summary of Impacts

It is anticipated that the proposed grazing system would increase vigor and production of the more preferred vegetation species. This improvement in range condition should be reflected in improved livestock conditions including health, calving and lambing rate, and increased weights at the end of the grazing season. Initial reductions in AUMs available for livestock would result in the short term to make allowances for wildlife and wild horses as well as for conversion from sheep to cattle. In the long term, anticipated forage production increases should permit increasing livestock use to 116,550 AUMs.

Other impacts would include:

1. Treatment A should reduce the incidence of scours and give the best weight gains.

2. Cattle herding required in some grazing systems for pasture movement could temporarily reduce weight gains or cause weight loss.

3. The proposed action includes additional water developments, which would reduce the time and energy used by livestock traveling to waters. The waters would make additional forage available.

4. Fences could cause cattle to congregate and reduce weight. This should last only until the livestock become familiar with the new grazing systems.

5. Later turnouts as proposed in several allotments would require:

(a) later lambing dates, thus lighter lambs in the fall, and

(b) increased forage demands on base property.

6. The proposal would create additional costs to operators because of more intense management requirements and maintenance of additional range improvements.

FARMING

The shortened grazing seasons for some allotments would reduce hay production by about 6,000 tons. This could be a significant impact on a few individual operators; however, it would not be significant on farming in general in the Sandy area.

FORESTRY

Trampling and browsing of conifers as described in the vegetation section analysis would lengthen the time before these trees reach a merchantable size. Damage under the two-and four-pasture alternately grazed systems would hamper growth and result in an estimated ten- to fifteen-year delay in the time in which the timber could be harvested.

About 15,000 board feet of timber per acre would not be available at the end of 100 to 110 years. This is a considerable amount of timber for the Sandy area. This impact would affect the commercial timber areas in the Prospect Mountain, Little Sandy-Little Prospect, White Acorn, and Gold Creek Allotments.

SOCIOECONOMIC CONDITIONS

The impacts of the proposed action would fall primarily into three categories: income; employment; and attitudes and expectations. While most of these impacts would be insignificant at the regional level, several of them would have significant effects on ranchers who depend upon the Sandy area to support their livestock operations.

See Chapter 2 Socioeconomic Conditions and APPENDIX 3E for discussion of relevant methodologies and computations not contained in this section.

Income

As indicated in Chapter 2, the income generated by use of the Sandy area amounts to less than 1% of regional income. The income asssociated wih livestock operations, recreation, construction, and maintenance would, however, create impacts that would affect local ranchers and residents directly associated with the area.

The information contained in this section should not be construed to be a benefit/cost (B/C) analysis. The B/C analysis is a separate study available for public review in the Rock Springs District Office. The results of the study are shown in Chapter 1, Description of Proposal.

Livestock

The same methodology that was used in Chapter 2 Socioeconomic Conditions to derive direct and total income effects of livestock use on the Sandy will be used in this section to determine the income impacts of the proposal on the four-county region and the Sandy licens-

ees. Because of the uncertainty of predicting price changes due to inflation over extended periods into the future, the current value of an AUM ($7.70) and the current livestock industry multiplier (2.75) will be used throughout this analysis.

In the short term (eleven years), there would be 125,516 AUMs per year available for livestock use in the Sandy area (see TABLE 3-61). This would be a reduction of 24,772 AUMs per year from the existing 150,288 AUMS available (see TABLE 2-24 and Chapter 2 Socioeconomic Conditions). This loss of AUMs would cause a decrease in direct income to the region of $190,744 per year (24,772 AUMs x $7.70 = $190,744.40). The total income impact would be $524,547 per year ($190,744.40 x 2.75 = $524,547.10). This is not a significant impact on a regional basis; however, it could create significant impacts to some individual ranchers using the Sandy area. It was estimated in Chapter 2 Socioeconomic Conditions that net rancher income was approximately 23.8% of the direct income from AUMs. This ratio would indicate that Sandy users would lose about $45,397 per year net income ($190,744.40 x 0.238 = $45,397.17). While this is not a significant number for all Sandy users, it could be significant to some specific ranchers. Even though this is not expected to occur, the income loss could, on an individual basis, represent a large percentage of a particular rancher's income. It could create a financial hardship for him and possibly require a change in his operation.

In the long term (23 years), there would be 166,550 AUMs per year available for livestock use in the Sandy area (see TABLE 3-61). This would be an increase of 16,262 AUMs per year over the current 150,288 AUMs available per year. The increase in AUMs per year would result in a direct income impact of $125,217 per year (16,262 AUMs x $7.70 = $125,217.40) and a total income impact of $344,348 per year ($125,217.40 x 2.75 = $ 344,347.85) in the four-county region. This impact would not significantly impact the regional economy. Net rancher income would increase by approximately $29,802 per year ($125,217.40 x 0.238 = $29,801.74). The increase would not be significant.

Recreation

Information to determine short-term recreation impacts is not available. In the long term, the proposal would cause an increase in visitor use for recreation activities in the Sandy area of approximately 131,785 visitor days (see TABLE 3-63). As indicated on TABLE 3-64, this would cause total expenditures for recreation activities to increase by $850,393.61. In Chapter 2 Socioeconomic Conditions, it was estimated that approximately 20% (per. comm., Phillips 1978) of recreationists in the Sandy area would be nonresidents of the region. It is this 20% that would generate new income in the region. When total expenditures are reduced for this effect, the direct income impact to the four-county region would be approximately $170,079 per year ($850,393.61 x 0.2 = $170,078.72). The total income impact would be $430,299 per year ($170,078.72 x 2.53 (recreation multiplier) = $430,299.16).

Construction and Maintenance

The proposed action requires improvements that would result in construction costs of $2,860,100 (see TABLE 1-14). These costs would occur only during the construction phase of the project lasting for seven years. The average annual effect of these construction costs would be $2,860,100 divided by 7 = $408,585.71. An unknown percentage of the amount would remain in the region as income to laborers and for the purchase of local material.

After the construction phase is completed, the range improvements would require maintenance. As indicated in the livestock grazing section, the annual cost of maintenance would be $91,210. These costs would mostly remain in the region as income to laborers and the sellers of materials; however, they could be considered a negative income because most of the maintenance would have to be done by ranchers using the Sandy area in exchange for installation of the improvements by BLM. Bureau maintenance costs would increase $18,565 per year.

Employment

The proposed action would create five ranching jobs (see APPENDIX 3E), five government jobs (see Chapter 1, Description of Proposal), and 4,341 man-days of construction employment. These jobs would constitute less than 1% of existing or projected employment in their appropriate sectors. These impacts are considered insignificant on a regional basis.

Attitudes and Expectations

The attitudes and expectations of residents would be impacted in three ways:

1. Those who value the open spaces as an entity and dying tradition would feel a loss because of the many fences that would be built. Many local residents would feel that the loss of the open spaces would reduce the quality of their lives and detrimentally affect a way of life valued by them.
2. Some local residents would resent and fear that the Federal government was encroaching too much in their lives. Others would feel that the government was getting too big because of the increased supervision and management associated with the proposal.
3. The proposed action would allow Sandy users the ability (with BLM approval) to convert from sheep operations to cattle operations, which many feel are more profitable. This flexibility would allow them to more easily respond to market changes.

TABLE 3-63

IMPACTS OF PROPOSED ACTION ON ANNUAL VISITOR DAYS FOR RECREATION ACTIVITIES

Activity (Categories Generalized)			Change
Visitor Days - Nonconsumptive Use		=	+117,478.00 days
Moose Hunting Days	7 X 1.32 1/	=	+ 9.24 days
Elk Hunting Days	-72 X 1.32	=	- 95.04 days
Deer Hunting Days	-13 X 1.32	=	- 17.16 days
Pronghorn Hunting Days	-1 X 1.32	=	- 1.32 days
Bird Hunting (Waterfowl and Upland Game Bird Days	1,527 X 1.32	=	+ 2,015.64 days
Fishing (Stream and Reservoir)	8,604 X 1.72 2/	=	+ 14,798.88 days
TOTAL			+131,784.92 days

1/ One visitor day = 1.32 hunting days.
2/ One visitor day = 1.72 fishing days.

TABLE 3-64

IMPACT OF PROPOSED ACTION ON EXPENDITURES FOR RECREATION ACTIVITIES

Activity		Change in Visitor Days		Value of Visitor Day		Total Impact
Visitor days-Nonconsumptive Use	=	117,478	X	$ 6.00	=	$704,868.00
Moose Hunting Days	=	9.24	X	$ 43.85*	=	$ 405.17
Elk Hunting Days	=	-95.04	X	$147.00	=	$-13,970.88
Deer Hunting Days	=	-17 16	X	$ 52.00	=	$ -892.32
Pronghorn Hunting Days	=	-1.32	X	$ 75.00	=	$ -99.00
Bird Hunting Days	=	2,015.64	X	$ 6.00	=	$ 12,093.84
Fishing Days	=	14,798.88	X	$ 10.00	=	$147,988.80
				TOTAL		$850,393.61

*The moose value was obtained from the Wyoming Game and Fish Department's strategic plan (1975). All other values are from BLM Washington Office Instruction Memorandum 76-455.

Summary

The proposed action would increase income in the region; however, it would be significant to only those persons directly asssociated with the Sandy area. The 16,262 AUMs per year increase would result in $344,348 more annual income by Year 23. Income from recreation activities would also increase $430,299 per year). Other income increases would include $408,586 per year for seven years from construction projects and $91,210 per year from rancher maintenance activities. There would be slight increases in employment. Resident attitudes and expectations would also be impacted.

IMPACT SUMMARY

A summary of predicted long-term cumulative impacts from implementing the proposed action for the various resource elements is shown in TABLE 3-65. Relative values were established for those resources for which it was impossible to predict specific estimates.

TABLE 3-65

LONG-TERM CUMULATIVE IMPACTS OF IMPLEMENTING THE PROPOSED ACTION

Resource	Elements	Cause for Change	Existing Condition	Long-Term Impact	Amount	Amount [5/] Of Change
Soils	sheet erosion, (tons/yr)	grazing systems	8,378,610	increased ground cover would reduce rate	6,925,953	-1,452,657
	compaction (acres) (heavy & severe grazing)	"	60,731	increase availability of water	87,215	+26,484
Water	ten year storm runoff (acre/feet)	grazing systems	29.5	increased ground cover would reduce rate	21.0	-8.5
	Sediment yield (tons/yr)	"	1,965,873	increased ground cover would reduce rate	1,681,308	-284,565
Vegetation	cattle forage (AUMs)	"	125,500	increased vegetal composition and plant vigor	172,833	+47,333
	sheep forage (AUMs)	"	142,861	"	196,049	+53,188
	wild horse forage (AUMs)	"	108,101	reduced because horse population would be reduced	75,337	-32,764
	antelope forage (AUMs)	"	146,427	increased vegetal composition and plant vigor	191,123	+44,696
	deer forage (AUMs)	"	135,674	"	209,819	+74,145
	elk forage (AUMs)	"	54,134	"	82,265	+28,131
	moose forage (AUMs)	"	7,331	"	10,609	+3,278
Terrestrial Wildlife	antelope populations (numbers)	grazing systems and fences	9,500[1/]	fences would restrict movement to crucial habitat	9,000	-500
	deer populations (numbers)	"	5,200[1/]	"	6,240	+1,040
	elk populations (numbers)	"	1,165[1/]	"	1,165	0
	moose populations (numbers)	"	56[1/]	"	56	0
Aquatic Wildlife	spawning habitat good (miles)	grazing systems	24	utilization of vegetation required for habitat maintenance and physical damage to streambanks	16	-8
	spawning habitat fair (miles)	"	35	"	24	-11
	spawning habitat poor (miles)	"	100	"	103	+3
	spawning habitat none (miles)	"	111	"	130	+19
	resident habitat good (miles)	"	27	"	19	-8
	resident habitat fair (miles)	"	171	"	133	-38
	resident habitat poor (miles)	"	30	"	68	+38
	resident habitat none (miles)	"	43	"	51	+8
	game fish population (fish/mile)	"	700-1,800	"	300-950	-400 to -850
Wild Horses	wild free-roaming behavior	fences reducing the size of the range	None	fences would restrict movement to traditional range and could cause injury	-Low[2/]	-30% or less
	water availability	controlled water developments	None	high stress (perhaps death) could occur around waters that are shut off	-Moderate[2/]	-30% to -75%
Cultural Resources	artifacts	livestock trampling & construction of range improvements	-Low[2/]	displacement and loss	-Severe	-30% to -75%
	historical trails	range improvements & trailing	-Low[2/]	fences crossing trails would reduce visual integrity & livestock trailing would damage trails.	-Moderate[2/]	-30% or less

TABLE 3-65 (Continued)

LONG-TERM CUMULATIVE IMPACTS OF IMPLEMENTING THE PROPOSED ACTION

Resource	Elements	Cause for Change	Existing Condition	Long-Term Impact	Amount	Amount [5/] Of Change
Visual Resources	visual class II objectives	range improvements	-Low[2/]	"skylining" of fences & locating them near recreation roads would not meet class II objectives	-Moderate[2/]	-30% or less
Recreation Resources	total visitor days use	grazing systems & range improvements	148,165	increased vegetation & ground cover	275,695	+127,530
Livestock Grazing	maintenance (dollars)	range improvements	unknown	additional range improvements would cost more to maintain	91,210	Unknown
	livestock AUMs permitted	grazing systems	150,288	increased forage	166,550	+16,289
Economics	income from AUMs yearly		$3,182,348[6/]		$3,526,696[6/]	$344,348[6/]
	cost of improvements yearly (dollars)		49,000[3/]		$408,586	$359,586[3/]
	income from recreation		$735,000[6/]		$1,165,299[6/]	$430,299[6/]

1/ Change from existing population levels established by the Wyoming Game and Fish Department.

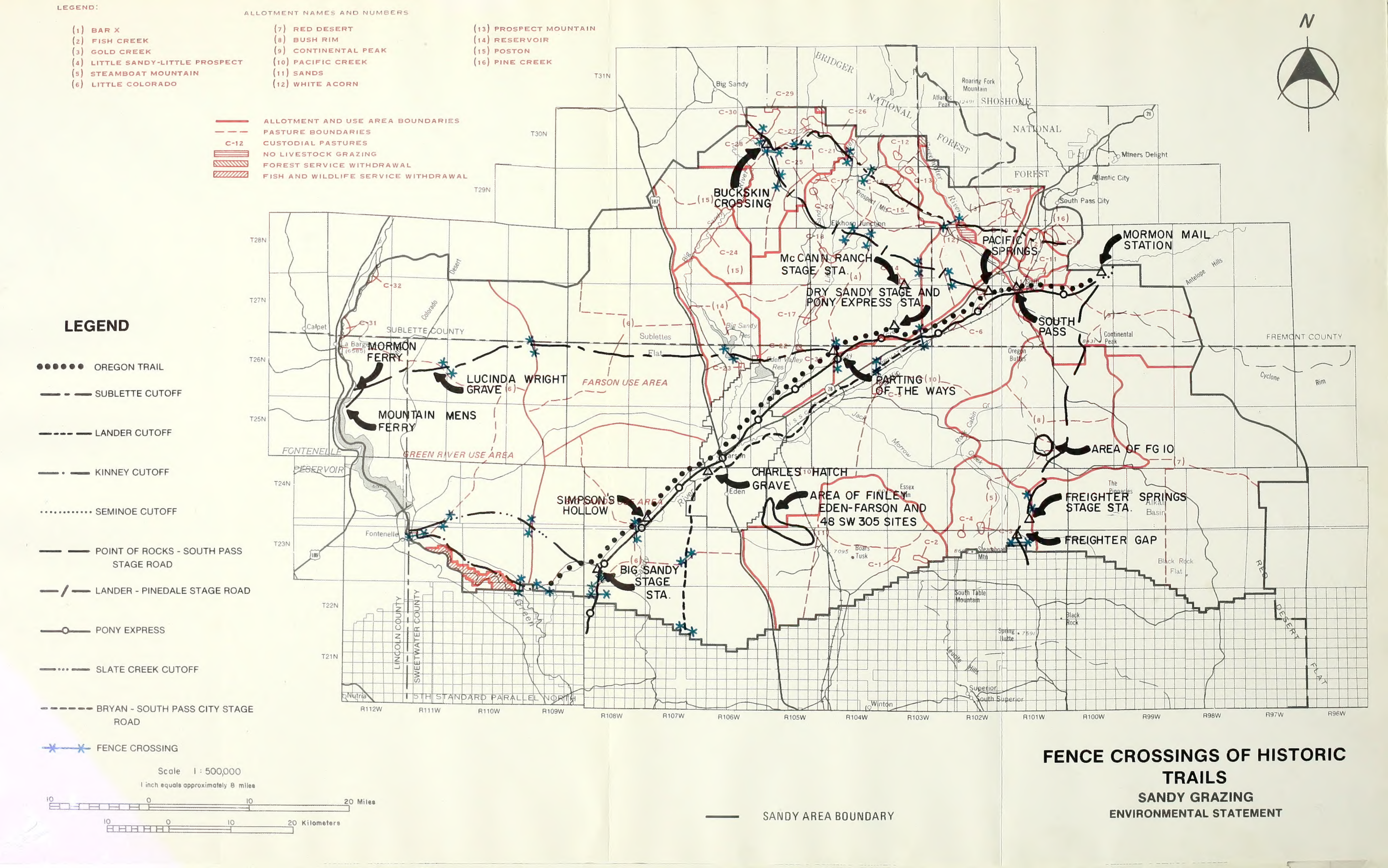
2/ The significance of adverse (-) or beneficial (+) impacts is unknown, therefore the following ranges are provided: low = less than 30% effect, moderate = between 30% and 75% effect and severe = more than 75% effect.

3/ Average dollars per year available for range improvements.

4/ Average cost per year of range improvements that would be constructed over a seven year period. Total cost of all range improvements = $2,740,100

5/ Amount of change is difference between existing and predicted condition. This doesn't indicate positive or negative impacts but only increases or decreases in measured conditions.

6/ Total income effect (i.e., computed income, multiplied by a livestock multiplier of 2.75).



FENCE CROSSINGS OF HISTORIC TRAILS
SANDY GRAZING
ENVIRONMENTAL STATEMENT

CHAPTER 4

MITIGATION MEASURES

MITIGATING MEASURES NOT INCLUDED IN THE PROPOSED ACTION

The BLM would be committed to the following measures if the proposed action were implemented. These measures are designed to eliminate or reduce the adverse impacts identified in Chapter 3. It is assumed that the existing and proposed improvements would be maintained, including proposed mitigating measures where applicable, as outlined in Chapter 1. The mitigating measures are addressed by components of the proposed action over the long term and are in a numerical sequence. Following this is an analysis of the effectiveness of each mitigating measure. The tabular summary (TABLE 4-6) located at the end of this chapter shows impacts (Chapter 3) by resource, mitigating measures (referred to by number), and the estimated degree of reduction of each impact. The summaries for soil and water resources are combined because the same measures were applicable to each.

GRAZING SYSTEMS

1. Impact: Livestock operators would have to lamb sheep on range other than that where the sheep traditionally lamb within the Sandy area or at a later date.

Mitigating Measure: The initial start grazing dates for sheep in the Little Sandy-Little Prospect, Pacific Creek, White Acorn, and Prospect Mountain Allotments would be changed to May 1.

2. Impact: Those pastures where water availability would be controlled by closing its access would cause stress on the wild horses and possible mortality if the water was not obtained.

Mitigating Measure: Wild horses would be moved by BLM personnel in conjunction with the movement of domestic livestock to pastures where water would be available in the Farson Use Area of the Little Colorado Allotment and in the Red Desert, Bush Rim, and Continental Peak Allotments. Control of livestock in these areas would be by water.

3. Impact: Closed gates would restrict big game and wild horse movement and would contribute to injury and mortality of the animals.

Mitigating Measure: Pasture gates in all allotments would be left open at all times when not needed for livestock and/or wild horse pasture management.

4. Impacts: Riparian zones which are important for waterfowl, sage grouse, and small bird nesting areas and for small animal as well as pronghorn, deer, and elk habitat, would be subject to trampling damage by livestock. Mortality of these animals could occur. Moose mortality could also occur as a result of livestock use of the riparian habitat, especially willow use.

The quality of the fisheries habitat would also be reduced because of livestock trampling.

Mitigating Measure: Fence 26 exclosures averaging 24 acres each for a total of 26 miles (approximately 618 acres) identified in four management units of key fisheries stream habitat within the Sweetwater, Big Sandy, and Little Sandy River, and Pacific Creek drainages. These areas are found in the Gold Creek, Little Colorado, Pacific Creek, White Acorn, and Prospect Mountain Allotments. This would permit development of key reaches of existing quality fisheries habitat where game fish populations are being or would be impacted by livestock grazing. These exclosures would permit improvement programs (i.e., willow plantings and gabion baskets) designed to improve habitat potentials under natural conditions. These sites would also serve as control areas to evaluate habitat conditions and trends of the proposed grazing systems within the respective allotments. The general location of these fenced exclosures is shown by allotment in TABLE 4-1. More specific details are available upon request from the Rock Springs District Office.

5. Impact: Livestock trampling would lead to erosion of archeological sites, breakage of artifacts, and destruction of historic trail traces.

Mitigating Measure: To avoid excessive trampling, salt would not be placed within a quarter-mile of known archeological or historic sites of national register significance, major paleontological sites, or historic trails.

6. Impact: Livestock trailing along historic trails would break down berms along the trail and destroy vegetation. This would compromise the trail's historic integrity.

Mitigating Measure: No trailing permits would be allowed that would cross known archeological, historic, or paleontological sites or along historic trails.

6a. Impact: Livestock trespass and deviation from proposed management systems would render all proposed livestock management systems potentially ineffective. Trend studies and other monitoring studies would not be reliable if actual use were not maintained as designed. Frequent bunching and counting of cattle would produce additional livestock stress, inconvenience to permittees.

Mitigating Measure: All licensed livestock in the study area would be subject to a livestock identification and control program. All licensed cattle would be ear-

TABLE 4-1

FISHERIES HABITAT EXCLOSURES

Allotment	Drainage Management Unit	Total Exclosures	Approximate Stream Miles	Approximate Acres
White Acorn	Sweetwater	3	2	48
White Acorn-Gold Creek Allotment Boundary	Sweetwater	3	5	120
Gold Creek	Sweetwater	11	7	192
Prospect Mountain	Upper Sandy	6	4	84
Little Colorado: Big Sandy Use Area	Lower Sandy	2	5	102
pacific Creek	Pacific Creek	1	3	72
SANDY AREA TOTALS		26	26	618

tagged. Ear tags would be furnished by the BLM and installed by operators. They would be color-coded by allotment and operator. Other types of marking would be considered, if requested. Alternate methods would have to be demonstrated to be equally as reliable as the ear tags in monitoring actual use. All licensed sheep would be made available for counting by BLM personnel on an annual basis. Counting arrangements would be made prior to issuance of licenses.

GENERAL

7. Impact: Range improvement projects (water and fence developments) could contrast with the natural character of the landscape.

Mitigating Measure: A visual contrast rating for each water and fence development would be made prior to construction of these projects and site-specific mitigating measures would be implemented as necessary to meet visual resource management (VRM) class objectives. In addition, following BLM policy where no additional cost is involved either economically or environmentally, the development would be planned to lower the contrast.

8. Impact: Construction of range improvements and vehicle access could cause displacement and destruction of artifacts and destroy undiscovered archeological, paleontological, and historical sites that may be located in the construction area.

Mitigating Measure: A 106 compliance statement (see Glossary) has been prepared and submitted to the State Historic Preservation Officer and the National Advisory Council on Historic Preservation covering the construction of range improvements. Consultation with the Advisory Council has not been completed at this time. Recommendations proposed by the Advisory Council would be adopted prior to implementation for any national register eligible site discovered prior to construction of any range project. In the event of any cultural values being discovered during construction, work would be stopped and the District Archeologist notified. He would then prepare a 106 compliance statement.

9. Impact: Headcutting and rill and gully erosion could be expected along access roads and fence lines because of soil compaction by livestock, wildlife, and vehicles.

Mitigating Measure: Project maintenance inspections (Chapter 1) of proposed range improvements (fences, water developments, and two-track access trails) would include a review to determine if excessive erosion was occurring. Culverts and/or waterbars would be installed immediately in areas where any excessive erosion was identified.

WATER DEVELOPMENTS

10. Impact: Livestock trampling would lead to destruction of historic trail traces.

Mitigating Measure: There are eight water developments in the Bar X, Little Sandy-Little Prospect, Little Colorado, Continental Peak, and the White Acorn Allotments that are within a quarter-mile of historic trails. Each would be relocated more than a quarter-mile from the respective trail.

11. Impact: In many instances, the archeological and historical values of an area are unknown or not identified. The potential exists for these unknown values to be destroyed upon construction of water development projects.

Mitigating Measure: All proposed water development projects, including two-track vehicle access trails, would be inspected by a BLM archeologist prior to construction to determine if any archeological, paleontological, or historical values are present. Additional mitigating measures such as avoidance, salvage, excavation, total surface collection, or other appropriate measures would be initiated to protect any values found that would be destroyed or damaged or where the historical integrity of a site or trail would be compromised. In the event of any cultural values being discovered during construction, work would be stopped and the District Archeologist notified. He would then take proper mitigating measures.

12. Impact: Heavy utilization around water sources would cause severe and heavy compaction from trampling in the Little Colorado, Red Desert, and Sands Allotments (see TABLE 4-2) because of poor livestock distribution.

Mitigating Measure: Additional water developments would be provided in the allotments shown in TABLE 4-2. Except for the Green River and Farson Use Areas, the additional facilities would involve providing pipelines from either existing and/or proposed wells. The two wells shown in TABLE 4-2 are in addition to those existing and proposed. More specific details are available upon request from the Rock Springs District Office.

13. Impact: Water developments as proposed would contrast with the natural character of the landscape.

Mitigating Measure: All storage tanks and stock tanks would be painted to blend with surrounding natural colors (beige, grey, earth brown, etc.). These structures would not be skylined where they could be seen from major recreation roads in the Little Colorado, Red Desert, Bush Rim, Continental Peak, Pacific Creek, and Sands Allotments.

14. Impacts: Reservoirs developed in alluvial type soils could increase erosion and sediment production because of these soils' highly erodible nature. Headcutting would occur below all of the proposed earthfill reservoirs due to increased channel slope. Loss of vegetation through construction and use of earthfill reservoirs would increase sheet erosion. Pit reservoirs would increase sheet erosion and sediment yield due to increased slope gradient and livestock use.

Mitigating Measure: All reservoir sites (earthfill and pits) would be examined by a soil scientist, a hydrologist, and possibly a geologist before final site locations are selected. This would facilitate design standards, reclamation procedures, and selection of sites suitable for reservoir construction, thus reducing the potential for embankment washouts and basins filling with sediment at an excessive rate. All areas disturbed during construction

TABLE 4-2

ADDITIONAL WATER DEVELOPMENTS

Allotment	Pastures	Acres	Wells (Quantity)	Pipelines* (Miles)
Little Colorado				
Green River Use Area	1, 2, & 3	303,791	1	17
Farson Use Area	1, 2, & 3	205,123	1	7
Big Sandy Use Area	1 & 3	140,253	0	6
Red Desert	1, 2, & 3	245,375	0	16
Sands	2	37,986	0	2
TOTALS	12	932,528	2	48

* Includes stock tanks located approximately every two miles.

would be leveled and reseeded with a mix of native and introduced grass species suitable to a given site.

Earthfill reservoir spillways would be designed to pass a ten-year storm without causing headcutting after the reservoir has lost all storage area to sediment. In order to meet this design standard, the maximum flow velocities should not exceed those in TABLE 3-11. The spillways and dams of these reservoirs would be temporarily fenced for at least two years with four-strand smooth wire to exclude domestic livestock and permit the establishment of vegetation on the spillways. The fence would be located 50 feet from the high water mark on the reservoir and at least 5 feet below the lower edge of the reservoir dam. The project inspection and maintenance program as proposed (see Chapter 1) would be expanded to identify headcutting and implement appropriate control measures. An area of approximately 200 square feet around the inlet of all reservoirs would be fenced with four-strand smooth wire to protect the established riparian area.

15. Impact: Pit reservoirs would increase sheet erosion and sediment yield due to increased slope gradient and livestock use.

Mitigating Measures: Off-channel pit reservoir design would be utilized in place of earthfill reservoirs wherever feasible. Excess excavated material would be spread on the hill slope upstream from the pit if the slope is less than 5%. When the slope is greater than 5%, the excavated material would be stockpiled upslope from the site.

16. Impacts: Fences restrict big game movement and contribute to mortality.

Livestock trampling and vehicle access would lead to erosion of potential undiscovered archeological sites and subsequent breakage of artifacts.

Increased livestock (cattle) use around existing and proposed water developments and perennial waters would cause increased mortality to nesting waterfowl, sage grouse, small birds, and other small animals due to trampling.

Mitigating Measure: Proposed fences around springs would have four-strand smooth wire instead of the proposed four-strand barbed wire and would be enlarged to enclose approximately 200 square feet to include any archeological sites. The size of the enclosure would be dependent upon the potential size of each archeological site.

17. Impact: Improved water availability through new water developments in some allotments would cause increased summer use of a traditional pronghorn antelope crucial winter habitat. Loss of winter forage would contribute to increased antelope mortality.

Mitigating Measure: Design and maintain water developments so they provide water for wildlife throughout the warm months between freezup periods except within the following areas (see MAP 3-1):

a. Pasture 3 of the Farson Use Area, Little Colorado Allotment.

b. Pastures 2 and 3 of the Big Sandy Use Area, Little Colorado Allotment.

c. Pasture 1 of the Sands Allotment.

d. Pasture 3 of the Pacific Creek Allotment.

18. Impact: Construction of two water developments in the Little Sandy-Little Prospect and Reservoir Allotments close to prairie dog towns could reduce the black-footed ferret (endangered species) populations by eliminating prairie dogs from the area or causing them to relocate.

Mitigating Measure: No livestock waters would be constructed within one-fourth of a mile of white-tailed prairie dog towns that are in the vicinity of recently documented black-footed ferret sightings. Two proposed water developments planned for the northern portion of Pasture 3 of the Reservoir Allotment and the water development proposed for the western edge of Pasture 1 of the Little Sandy-Little Prospect Allotment would be relocated. Other water developments would be relocated if prairie dog towns were discovered within a quarter-mile of the proposed development.

19. Impact: Two proposed earthfill reservoirs in Pasture 3 of the Continental Peak Allotment would exceed the visual contrast objectives for Class II because livestock trampling would result in a loss of vegetation that would make them highly visible from the adjacent road.

Mitigating Measure: The two proposed earthfill reservoirs to be located near Honeycomb Buttes, Pasture 3 of the Continental Peak Allotment, would be relocated to the north and east one-half to three miles, depending on topography, so they would not be visible from the adjacent road.

20. Impact: Loss of vegetation during pipeline construction would contrast with the surrounding natural landscape and exceed the VRM Class II objectives for the area where highly visible from the adjacent road.

Mitigating Measure: The proposed pipeline near the Boars Tusk in the Sands Allotment would be constructed so it would cross the road at a right angle. Disturbance of the area within 150 feet of either side of the road would be kept to a minimum (preferably 5 to 6 feet) during construction, and this area would be allowed to revegetate naturally.

21. Impacts: Wells that would be shut off or built so small animals would not be able to effectively use them would cause wildlife mortality. These animals could suddenly be deprived of a water source upon which they have become dependent.

Increased livestock (cattle) use around existing, proposed, and perennial waters would cause increased mortality to sage grouse, waterfowl, small birds, and other small animals due to trampling.

Mitigating Measure: Each well would have a pipeline leading approximately 100 to 500 feet to a small water basin. The 50 square foot area around the basin would be fenced with four-strand smooth wire to exclude domestic livestock. The basin size would be 6 feet by 4 feet by 12 to 18 inches deep for small animal use. Leaks would be prevented by adding bentonite, a precast concrete basin, or other suitable linings during construction. More specific details are available upon request from the Rock Springs District and in BLM Technical Note Number 298.

FENCES

22. Impacts: Fences would contribute to big game mortality. Until wild horses became acquainted with the fences and cattleguards, they could be injured by running into the structures.

Fences located on top of ridges would be skylined and highly visible thus increasing the visual contrast.

Mitigating Measure: Fences built across wildlife and wild horse movement areas would be located on ridge tops approximately 50 feet from the high elevation line of the ridge to avoid skylining where they would be viewed from major recreation roads. Additional wood line posts (vertical) would be located every seventh post and a white or shiny disc 10 to 12 inches to diameter installed on these posts to make the fence more visible to the animals.

23. Impact: Livestock grazing in campgrounds would impact the recreation use by diminishing the experience and posing a potential health hazard to recreationists.

Mitigating Measure: The Sweetwater Campground (approximately 5 acres) and Squaw Creek Campground (approximately 24 acres) would be fenced with buck and pole fence. The fenced areas would be small enough not to require adjustments in the proposed livestock management.

24. Impact: Fences located on top of ridges would be skylined and highly visible, thus increasing the visual contrast.

Mitigating Measure: The Pacific Creek-Sands Allotment boundary fence located along Jack Morrow Rims Landscape Type would be relocated approximately 150 feet to the northeast for about 3 miles so the fence would not be skylined as seen from the adjacent road. The fence would also be relocated approximately one-fourth of a mile to the northeast where it crosses Joe Hay Rim.

25. Impact: Fence construction and maintenance activities along with livestock trampling would displace and destroy artifacts of potential undiscovered archeological and historical sites.

Mitigating Measure: An archeologist would walk staked fence lines while surveyors are still in the field to determine if there are any archeological, paleontological, or historic sites near the proposed fences or gates. The fence or gate would be moved if any sites are located. Any site within 50 feet of a fence and 200 feet of a gate that cannot be avoided would be salvaged after a 106 compliance statement (see Glossary) was prepared.

26. Impact: Fences along historic trails would visually detract from the historic setting, disturb historic remains, and encourage livestock and vehicle trailing along the historic trail.

Mitigating Measure: TABLE 4-3 shows fences that would be rerouted away from historical trails.

27. Impact: The impact is the same as identified for measure number 26.

Mitigating Measure: Where the fence crosses the Lander Cutoff in the Gold Creek Allotment, a post and pole fence with a steel gate painted grey would be constructed. The wooden fence would impart more sense of historic setting to the trail in a mountainous area than would steel fence posts. The wooden section would continue until the fence could blend with the adjacent landscape or a maximum of a quarter-mile to reduce the visual contrast. A sign describing the trail and stating that no surface disturbance would be allowed within one-fourth of a mile of the trail would be placed on the fence. A 106 compliance statement (see Glossary) has been prepared and submitted to the State Historic Preservation Officer and the National Advisory Council on Historic Preservation covering the crossing of historic trails by fences in 55 locations. Consultation with the Advisory Council has not been completed at this time. Recommendations proposed by the Advisory Council would be adopted prior to implementation.

28. Impact: The impact is the same as identified for measure number 26.

Mitigating Measure: Where the historical trails shown in TABLE 4-4 have had a continuous pattern of use and still retain high-quality ruts, the fence crossings would be constructed with cedar posts instead of the proposed steel posts. Gates would also have cedar posts instead of standard wooden posts. The cedar posts would impart more sense of historical setting to trails in the desert than steel fence posts. The wooden section would continue until the fence could blend with the adjacent landscape or a maximum of a quarter-mile to reduce visual contrast. A 106 compliance statement (see Glossary) has been prepared and submitted to the State Historic Preservation Officer and the National Advisory Council on Historic Preservation covering the crossing of historic trails by fences in 55 locations. Consultation with the Advisory Council has not been completed. Recommendations proposed by the Advisory Council would be adopted prior to implementation. The trail would be inspected before construction; if relic ruts were found at any of the crossings, then a 100-foot section of cedar post fence without a gate would be built across the trail to help preserve the quality of those ruts. Signs describing the trails and stating that no surface disturbance would be allowed within one-fourth mile of the trail would be placed on the fence. Trail crossings would be located as listed in TABLE 4-4.

29. Impacts: The impact is the same as identified for measure number 26.

Mitigating Measure: In the cases shown in TABLE 4-5, the trails have been bladed to the point where most historical setting has been lost. There would be little impact caused by crossing these trails with a gate or cattleguard. Where the bladed, maintained road runs straight through high-quality meandering ruts, the remaining discontinuous ruts would be fenced without a gate where the fence line crosses them. A sign interpreting the trail and prohibiting surface disturbance of the remaining ruts would be placed on the fence.

30. Impacts: Constructing proposed developments from March through June near peregrine falcon eyries would disturb falcon breeding and nesting and could cause increased mortality.

Mitigating Measure: Fence construction would not occur from March through June within one-half mile of areas known or suspected to have peregrine falcon eyries

TABLE 4-3

FENCES WHICH WOULD BE REROUTED FROM HISTORICAL TRAILS

Allotment	Location	Trail	Approximate New Location	Approximate Length
Little Sandy-Little Prospect	S4, T26N, R104W	Oregon Sublette	Move fence ¼ mile north along county boundary line	2 miles
Little Sandy-Little Prospect	S25, T27N, R103W	Oregon	Move fence ½ mile to the north side of Section 25 to Highway 28	1 mile
Little Colorado	S36, T24N, R108W	Oregon	Move fence ¼ mile east of the proposed location	½ mile
Little Colorado	S14,15,16 T26N, R111W	Sublette	Move fence south ¼ mile	3 miles
Reservoir	S11, T26N, R106W	Sublette	Relocate fence 1000 feet through area disturbed by pipeline	1000 feet
Prospect Mountain	S18, T30N R105W	Lander	Angle fence ¼ mile from section line to District boundary	3/4 mile
	S24, T30N, R105W S19, T30N, R104W	Lander	Move fence 1/8 mile to section line between Sec. 24 & 25. At juncture of two ranges, angle north at 45°.	1½ miles

TABLE 4-4

TRAIL CROSSINGS WHERE CEDAR WOULD BE USED

Allotment	Location	Trail
Gold Creek	S35, T29N, R102W	Lander Cutoff
Little Sandy-Little Prospect	S28, T26N, R105W	Oregon Trail
Steamboat Mountain	S16, T24N, R101W S8, T23N, R101W	Point of Rocks-South Pass City Stage Road
Little Colorado	S2, T23N, R110W	Kinney Cutoff
Little Colorado	S4, T26N, R109W	Sublette Cutoff
Little Colorado	S31, T23N, R109W	Slate Creek
Little Colorado	S35, T24N, R111W	Slate Creek
Little Colorado	S21, T22N, R107W	Bryan to South Pass City Stage Road
Little Colorado	S15, T23N, R107W	Bryan to South Pass City Stage Road
Little Colorado	S6, T22N, R108W	Oregon Trail
Pacific Creek	S7, T26N, R103W	Bryan to South Pass City Stage Road

TABLE 4-5

TRAIL LOCATIONS NEEDING PROTECTION OF RUTS

Allotment	Locations	Trail
Little Colorado	S9, T26N, R111W	Sublette Cutoff
Little Colorado	S4, T22N, R107W	Oregon Trail
Little Sandy-Little Prospect	S11, T28N, R104W	Lander-Pinedale Stage Road
Little Sandy-Little Prospect	S12, T28N, R104W	Lander-Pinedale Stage Road
Little Sandy-Little Prospect	S25, T28N, R103W	Lander-Pinedale Stage Road
Little Sandy-Little Prospect	S5, T29N, R103W	Lander Cutoff
Little Sandy-Little Prospect	S36, T30N, R104W	Lander Cutoff
Prospect Mountain	S27, T30N, R105W	Lander-Pinedale Stage Road
Prospect Mountain	S27, T30N, R105W	Lander-Pinedale Stage Road
Prospect Mountain	S27, T30N, R105W	Lander-Pinedale Stage Road
White Acorn	S32, T28N, R102W	Lander-Pinedale Stage Road

such as: (1) cliffs on or about the Oregon Buttes; (2) cliffs along the Green River; (3) cliffs along the Sweetwater River; and (4) cliffs on or near Steamboat Mountain.

31. Impact: Livestock grazing in areas that would be clearcut or selectively cut in the future would destroy established seedlings.

Mitigating Measure: All forested or timbered areas which would be clearcut or selectively cut under future timber sales and have large amounts of new revegetation (timber seedlings) would have temporary fencing placed around them to keep out livestock. This temporary fencing would be taken down whenever 50% of the seedlings attained a height of 5 feet and no longer would be affected by livestock grazing.

32. Impact: Fences restrict big game movement and contribute to mortality.

Mitigating Measure: All proposed or existing allotment and pasture fences that cross riparian areas approximately 100 to 200 feet wide in moose crucial habitat would be modified. The Farson and Big Sandy Use Areas of the Little Colorado Allotment and the Steamboat Mountain, Red Desert, Bush Rim, Continental Peak, and Sands Allotments do not have such habitat. Modifications would include a wooden rail placed across the top of the fence and smooth wire fencing for the width of the riparian area.

33. Impact: The impact is the same as identified in measure number 32.

Mitigating Measure: Three-strand wire fencing (Chapter 1) would be used in accordance with BLM Fencing Manual 1737 instead of the proposed four-strand wire fencing to facilitate pronghorn antelope migrations in all allotments except Bar X, Fish Creek, Gold Creek, White Acorn, Pine Creek, and Pastures 4 and 5 of the Little Sandy-Little Prospect and Prospect Mountain Allotments. Approximately 87 miles of four-wire fence would remain in these allotments.

CATTLEGUARDS

34. Impact: Fencing would impact recreation visitors by requiring them to open and close gates.

Mitigating Measure: Ten additional cattleguards would be placed at key access points in the Gold Creek, Little Sandy-Little Prospect, White Acorn, and Prospect Mountain Allotments.

ANALYSIS OF EFFECTIVENESS OF MITIGATING MEASURES

1. Providing an initial start grazing date of May 1 would eliminate the impact of the livestock operators having to lamb their sheep on range other than that where the sheep traditionally lamb within the Sandy area or at a later date. This measure would allow the livestock operators to continue their present operations without change at a most critical point in their operations.

2. Moving the wild horses into pastures of the Farson Use Area of the Little Colorado Allotment and in the Red Desert, Bush Rim, and Continental Peak Allotments in conjunction with the domestic livestock movements would eliminate over the long term the increased stress impact on wild horses from lack of water. The rotational use of the pastures within these allotments would be maintained by controlling the availability of water. As water is shut off, denying access to the livestock and wild horses, these animals would be moved to the next pasture scheduled for grazing where water is provided. Wild horses require water as often as domestic livestock. Since the controlled water developments are the only water source in these allotments, the horses would be relatively close (within 2 miles) and could, therefore, be moved in conjunction with the livestock. It is felt that during the first two years less than 5% of the horses would return to areas where the waters have been shut off. Once the horses adjusted to the pasture moves, the impact would be eliminated.

3. Leaving pasture gates open at all times when not needed for livestock and/or wild horse pasture management would reduce the impact of restricted movement and injury to wild horses by approximately 75%. This situation would occur during the winter following the grazing season. This impact reduction would be based on complete enclosure of wild horses within a specific pasture at that time, then allowing them access to other pastures within the allotment by opening the pasture gates later in the year. Some injury to wild horses would be expected to occur until they become familiar with open gate locations as they try to cross through fences.

It is felt that the wild horses would follow fences, seeking openings or places where they would be able to cross into the adjacent pasture. They would therefore find the open gates (located approximately every mile, Chapter 1) as they become familiar with the fences. Opened gates would probably not completely facilitate freedom of movement for wildlife as they would still prefer to cross fences at locations they choose. Horses would probably still choose the easiest crossings.

4. The 26 exclosures on the Sweetwater, Big Sandy, and Little Sandy River and the Pacific Creek drainages would reduce the livestock trampling impact by 95% and thus improve the nesting and breeding habitat of sage grouse and waterfowl within these areas. Restricting livestock use on willows would reduce moose mortality by 5%.

The quality of the fisheries habitat on the 26 miles of stream, which includes 5% of the spawning habitat and 12% of the resident habitat in the area, would be improved since livestock would be eliminated from these areas. This would increase the total game fish populations in the Sandy area by 15%. Wildlife would still have access to the exclosures; thus physical damage to streambanks and trampling of nests would not be completely alleviated. The vegetation within the exclosures would be allowed to grow with only limited grazing, primarily by moose. This would improve the fisheries habitat, provide ample forage for moose, and provide cover for sage grouse and waterfowl.

5. It is estimated that about 75% of the trampling impact on archeological or historical sites would be eliminated by locating salt for livestock at sites greater than a quarter-mile from the sites. This would confine the trampling to areas where archeological or historical sites are less likely to occur. These impacts could not be completely eliminated since all archeological and historical site locations are not known.

6. The disallowance of trailing permits along historic trails or across known archeological sites would serve to alleviate the trampling damage by 75%, as expressed in measure number 5. Some livestock use would still occur during the grazing season as livestock search for food. This use could not be controlled.

6a. Effectiveness: Actual use data would be significantly more reliable and easier to monitor and control by allotment than by pasture. Short-term stress to cattle would be greater than without the measure due to the additional handling required for installing ear tags for cattle or the corral counting for sheep. The long-term impact would be less, however, as livestock adjust to the annual procedures. Fewer number of people could effectively monitor livestock use than would be required for regular counting, classification of brands, etc.

7. Contrast of range improvements with the characteristic landscape can be reduced through site-specific mitigating measures determined by the use of the contrast rating system (BLM Manual 6320). The contrast of range improvements will vary depending upon the type of project and the exact location of that project.

8. Preparation of a 106 compliance statement would inform the Advisory Council on Historic Preservation as to the nature of the proposed action, its effect on cultural resources, and possible means of mitigating the effect. The mitigation could vary from 10% to 100% depending on the nature of the cultural resource and the impact. For example, changing the construction of a fence across a historic trail would only mitigate the impact of crossing the trail by 10%, but the fencing of an archeological site could mitigate the impact of trampling on the site by 100%. Based on the 106 statement, a memorandum of agreement between the BLM and the Advisory Council on Historic Preservation would include measures that would assure that the cultural resources would be protected as much as possible from the effects of the proposed action.

9. Measures designed to reduce erosion such as culvert and waterbar installation would be used where project maintenance inspections would indicate excessive erosion was occurring. Actual erosion damage (such as headcutting) is often times difficult to assess during construction of a project; therefore, monitoring is necessary. When a problem arises, it should be alleviated by appropriate measures before it has a chance to accelerate beyond control. Often a headcut, if unchecked, will accelerate as much as two feet a year.

10. Relocating the eight water developments which are presently within a quarter-mile of historic trails in the Bar X, Little Sandy-Little Prospect, Little Colorado, Continental Peak, and White Acorn Allotments would reduce livestock trampling of these trails by 95% and visual impacts by 75%. Heavy concentrated livestock use occurs within a quarter-mile of a watering facility. Use beyond a quarter-mile would still occur but would be considered light.

11. Inspections of all proposed water development projects by BLM archeologists would prevent the destruction of any archeological, paleontological, or historical values which may be present. Inventories of these values are not complete, and they are, therefore, unknown at present. Destruction of any values that may exist would be expected from construction activities as proposed unless any sites in construction areas have been either protected or salvaged prior to project development.

12. Development of additional watering facilities, including wells and extensive pipeline systems in the Little Colorado, Red Desert, and Sands Allotments, would reduce the severe and heavy compaction on 19,244 acres within these allotments by 31%, or 6,037 acres. Utilization around existing waters would be reduced from the present 70 to 90% to 60 to 80%. An additional 75,536 acres (7% of these allotments) would be made available to livestock during the summer.

Increased numbers of waters have the effect of providing better distribution of livestock and wildlife throughout an allotment, thereby reducing the degree of compaction and intensity of utilization around existing waters.

13. Measuring the degree of impact reduction of painting storage and stock tanks to blend with the surrounding landscape cannot be determined at this time. Each site requires a close and individual analysis. Painting these facilities a natural color, where they stand out against the landscape, would help to maintain a sense of naturalism and reduce the visual contrast with the surrounding countryside.

14. Examination of reservoir sites by a soil scientist, hydrologist, and possibly a geologist would serve to identify the potential for headcutting and sediment accumulation in proposed reservoirs. This could reduce headcutting by 75% and sediment accumulation in earthfill reservoirs from sheet erosion by 89%, or 6.72 tons per year per reservoir. Proper examination and planning would serve to properly place these reservoirs in locations where headcutting and sediment accumulation impacts would be less likely to occur. Designing reservoir spillways to pass a ten-year storm without causing headcutting after the reservoir has lost all storage area to sediment and fencing the spillways, dam, and established riparian areas would serve to mitigate the impacts as expressed in measure 14. Effective designs and precautionary measures for retaining the soil through vegetation growth would serve to eliminate potential erosion problems.

15. Replacing proposed earthfill reservoirs with properly designed off-channel pit reservoirs and placement of excess excavated material out of the stream bed would eliminate excess sediment yield further downstream. Total sheet erosion from the proposed pit reservoirs would be reduced by approximately 400 tons per year (64%). Pit reservoirs would be more adequate, serve the

area for a longer period of time, and yield less sediment downstream than earthfill reservoirs which are often constructed in streambeds.

Pit reservoirs are constructed by excavating material, thus creating a hole rather than damming up a drainage with fill (FIGURES 1-7 and 1-8). Therefore, in the event of a high storm runoff, water flooding over the pit reservoir embankment would not be increased in velocity and would flow with the material drainage gradient. Water velocity over an earthfill embankment, however, would be increased since the elevation of the water in the reservoir would be raised 10 to 20 feet above the natural gradients, thus causing headcutting and sediment load. Stockpiling material excavated from pit reservoirs out of the stream channel would prevent that material from washing into the stream during a storm. This could result in sedimentation in the pit, but this would be preferred to downstream sedimentation.

16. Modification of the proposed four-strand barbed wire fences around springs to three-strand smooth wire and enlarging the fenced area to include nearby archeological sites would aid in the reduction of injury and death to wildlife and protect archeological values found on those sites. Wildlife use would be expected at the springs because lush forage would be available there. The three-strand, smooth wire construction would make it much easier and safer for wildlife to utilize these areas. Protection of the archeological remains with this fencing would prevent excessive trampling and thus preserve those values. The allowance for additional fenced area if an archeological site's size makes it necessary would assure proper protection of the site.

17. Constructing water developments suitable to accommodate local wildlife in all allotments except Pasture 3 of the Farson Use Area and Pastures 2 and 3 of the Big Sandy Use Area, Little Colorado Allotment; Pasture 1 of the Sands Allotment; and Pasture 3 of the Pacific Creek Allotment would eliminate the impact of additional summer wildlife use on traditional antelope crucial winter habitat. This would eliminate anticipated increases in mortality from reduced winter forage availability.

Improved distribution of wildlife in the Sandy area (less localized utilization) would be anticipated in all allotments except those identified above, where increased or distributed use would not be desirable.

18. Not locating new livestock waters within one quarter-mile of known white-tailed prairie dog towns where documented sightings of black-footed ferrets have occurred and relocating existing waters which are found too close to those prairie dog sites would eliminate the impact of prairie dog and black-footed ferret mortality from town relocation caused by livestock intrusion.

Waters not made available to livestock within one quarter-mile of prairie dog towns should minimize livestock use of that area in large concentrated numbers.

19. Relocating two earthfill reservoirs in Pasture 3 of the Continental Peak Allotment would reduce the visual impacts to within the Class II objectives as explained in the visual resources section of Chapter 2.

In addition to the actual removal of a foreign structure from the readily visible landscape, the livestock trampling and eventual loss of vegetation around each of these sites would be alleviated through relocation of the reservoirs. The visual contrast would not be obstructed as a result of this action.

20. Proper location of the proposed pipeline in the Sands Allotment where it crosses the road and allowing the minimum disturbed area to revegetate naturally would reduce the visual impacts to within the Class II objectives as explained in the visual resources section of Chapter 2.

Constructing this project within the specifications indicated would result in a minimal visible impact to the visitor.

21. Adding fenced-off, pipeline-fed water basins to each new well site project would eliminate mortality to small game because of lack of water and provide a watering area with suitable cover which can be used effectively by the small animal population.

The majority of existing waters do not benefit small game because access is limited or cover around the water is not adequate to encourage its use. The proposed measure should improve the situation.

22. Locating fences just below the high elevation line in wildlife and wild horse movement areas and using more wooden posts with shiny discs for increased wildlife and wild horse visibility would reduce injuries to wildlife and wild horses from the fences by 30% to 70%. Relocating the fences would reduce the visual impacts to within the VRM Class II objectives as explained in the visual resources section of Chapter 2. Visual impacts are increased greatly in areas where fences cross over ridges near or adjacent to visitor access routes.

23. Small areas relatively insignificant to forage production would be fenced off around the Sweetwater and Squaw Creek Campgrounds totalling approximately 5 acres and 24 acres, respectively. This action would improve the recreation experience for 2,933 annual visitor days use and reduce the health hazard by approximately 90%.

Livestock feces accumulation around campsites would be eliminated, and stream pollution in close proximity to the campsites would be greatly reduced thereby improving the quality of recreation activity.

24. Relocating the Pacific Creek-Sands Allotment boundary fence from the ridgetop on Jack Morrow Rim and across Joe Hay Rim would reduce the visual impacts to within the VRM Class II objectives as explained in the visual resources section of Chapter 2. Keeping the proposed fences off the ridgetops where they may be skylined would keep the visual impacts from major access routes at a minimum.

25. On-the-ground inspections of proposed fence lines by an archeologist prior to construction would locate previously undiscovered archeological, paleontological, or historic sites and enable measures to be taken that would reduce damage or destruction of these sites by 95%. The moving of proposed fences and gates would prevent damage from construction, vehicles, and cattle trailing to the various sites if the travel along these structures is rerouted.

26. The rerouting of fences away from historical trails would eliminate 75% of the visual impact and 95% of the trampling damage to these trails. Relocating fences at distances shown in TABLE 4-3 away from historic trails would in most cases reduce the severity of the fence's visual impact.

27. Constructing a portion of the fence crossing the Lander Cutoff trail in the Gold Creek Allotment with wooden posts and poles would reduce the visual impact to the trail by 25%. The wooden post and pole construction of this type of fence would blend into the landscape and thus would tend to make this project more palatable to visitors.

28. The use of cedar posts instead of steel posts on fences and gates that cross historical trails with high quality ruts (TABLE 4-4) would reduce the visual impact by 25%. Cedar post fence enclosures around relic ruts would eliminate their destruction. Measures such as these would tend to preserve the historical significance of the area at specific trail locations.

29. Fencing without gates across historical trails with high quality discontinuous ruts, where blading has occurred, would serve to mitigate the impact by as much as 95%. This would restrict continued through traffic by vehicles and would help to retain the historical significance of the trail. The installation of interpretive signs should serve to obtain public support of the action as well as to inform them of the trail's historic significance.

30. Restricting fence construction activities that would occur within one-half mile of peregrine falcon eyries during the period of March through June would reduce the harassment impact by 90%. Limiting extensive human activities in close proximity to falcon crucial habitat during critical times of the year would benefit this species through its life cycle processes.

31. Temporarily fencing all clearcut or selectively cut timbered areas would eliminate the damage to seedlings from livestock trampling. New seedlings found in freshly cut timber areas are easily damaged by livestock in their early growth stages, but they are enhanced when livestock grazing is restricted until an average height of 5 feet is attained.

32. Modifications of fences crossing riparian areas in moose crucial habitat to include a wooden top rail and smooth wire in place of the barbed wire would reduce moose mortality by 2 to 5%. Injury and mortality to moose from fences would be reduced by making the structure more visible and less damaging.

33. Modification of the proposed four-strand barbed wire fencing in antelope migration areas to three-strand barbed wire would reduce antelope injury and mortality by 3%. Making a fence more passable for the antelope populations tends to increase their chances for survival during migration periods.

34. Installing 10 additional cattleguards at key access points in various allotments along the Wind River Front in the northern Sandy area would reduce impacts to hunters by 20% and to sightseers by 80%.

Improving access through installation of cattleguards would provide a more pleasant experience for visitors in an area of high visitor appeal by reducing the inconvenience of opening and closing gates. Access to the Bridger-Teton and Shoshone National Forests also would be improved.

MONITORING STUDIES

The Bureau of Land Management would record and analyze changes in the Sandy area environment that would result from implementation of the proposed action, including progress toward achievement of the proposed management objectives. Monitoring programs designed to gather pertinent data would be started during the initial stages of the proposal's implementation.

The proposed allotment management plans (AMPs) include studies that would monitor the effects of the proposed action on range condition, trend, utilization, and phenology of the vegetative species in each allotment. Key areas identified in the AMPs have been proposed for monitoring because of their proximity to critical watershed areas, important wildlife habitat, and/or representative livestock forage areas. Each key area would have a permanent transect for monitoring range trend, changes in range condition, and production based on the assumption that changes in these areas would be representative of the entire allotment.

The primary studies listed below would enable the manager to determine the rate of progress toward meeting or exceeding the objectives of the AMP and whether this rate indicated the need or lack of need for modifying with either more or less intensive grazing system, amount of use by livestock, season of use, or any combination of these. Should the studies indicate an adverse impact on the environment would occur if the proposed grazing system is continued, the system would be modified and an environmental assessment record prepared prior to implementation of the revised plan.

Primary studies provided by the proposed AMPs include:

1. Actual use records of reduced livestock numbers, delayed turnout, livestock losses to predators and poisoning, and authorized changes during the grazed season would be kept for each pasture by each licensee, and these records would be submitted annually to the area manager. These records would be important in determining the needs for changes in the grazing system, and they would be kept in accordance with BLM Manual 4410.22A. Their reliability would be increased by a program of livestock identification as outlined in Mitigating Measure 6a.

2. Utilization checks would be made two or three weeks prior to seedripe date in each early-use pasture and following removal of all livestock in each grazed pasture in accordance with BLM Manual 4410.22B. Browse utilization checks would be made annually.

3. Trend studies as described in the Wyoming Integrated Study Procedure would be carried out immediately before implementation of the proposed grazing systems and during the rest treatment of each subsequent grazing cycle. Photographs would be taken at each permanent transect as described in the procedure.

4. Plant development information on key species would be made on the rested pastures annually about two or three weeks prior to the established seedripe date to see if the pasture is ahead of or behind a "normal"growing season. The phenological study method in BLM Manual 4410.22B would be used.

5. Rain gauges would be established in the AMP area. Precipitation and evaporation data would be collected by BLM personnel after thunderstorms or monthly, whichever is the most frequent. Precipitation-evaporation ratios rather than total precipitation would be used in conjunction with range trend and condition studies.

Wildlife browse species and important vegetation subtypes within crucial winter habitat of each pasture would be included in the above studies. Of special interest would be crucial winter habitat where Treatments A (graze season long), Treatment B (rest until seedripe, then graze), and Treatment D (rest until peak of flowering, then graze) would be used. This would include the pastures of the Prospect Mountain, Little Sandy-Little Prospect, White Acorn, and Gold Creek Allotments. These studies would be designed to determine if key wildlife forage species would be overutilized under Treatment A and, if so, to decide if Treatment A should be replaced by Treatment E or if livestock numbers should be reduced in these areas.

Annual trend and utilization evaluation as proposed in the AMPs would include riparian vegetation species in each pasture to determine the impact of the respective grazing system on these critical zones for terrestrial and aquatic wildlife.

Other specific studies designed to monitor soils, water, and terrestrial and aquatic wildlife habitat would be conducted by the Bureau to determine the proper measures for these key environmental elements in the Sandy area.

Soils and Terrestrial Wildlife

Six study exclosures (three in the Steamboat Mountain Allotment, two in the Bush Rim Allotment, and one in either the Red Desert or Continental Peak Allotment) would be established in areas of steep, highly erodible soils to: (1) establish the actual rate of erosion occurring under varying treatments, degrees of slope, and soil conditions; (2) measure vegetation response in terms of vegetal ground cover; and (3) determine the degree that livestock could be decreasing or increasing the erosion potential of these soils.

Actual site selection would be based on uniformity of soils, slope, and distance from known sources of water. Measurements would be taken prior to initiation of the proposed action and annually in the month of July for three years or until the trend is established. Measurements would then be taken every other year for six years or longer if deemed necessary to monitor the trend.

This study would be conducted in wildlife crucial winter habitat, and it would also be used to determine if this habitat would be affected significantly by livestock. Some livestock grazing would be allowed in these areas only during the period when the seeds of the stabilizing vegetation species would drop. Trampling by the livestock would promote germination by "planting"the seed firmly into the soil.

Should this study indicate that livestock are increasing the erosion potential of Mapping Units 132, 233, and 333, one of the following actions could be taken and monitored to determine if more restrictive management measures are necessary in these areas:

1. The number of livestock grazing in these areas would be reduced.
2. The season of use in these areas would be limited to the summer months.
3. Both 1 and 2 would be implemented.

Water Resources

All proposed earthfill reservoirs would be examined for at least two years following construction to determine their ability to retain water throughout the grazing season (May through October). Those that are found to retain water throughout this season would be fenced with three-strand smooth wire. The fenced area would include an area 50 feet from the highwater mark on the reservoir and 5 feet below the lower edge of the reservoir dam. Stock tanks would be located outside the fence at the lower edge of the reservoir.

Terrestrial Wildlife

Newly constructed fences would be patrolled by BLM and Wyoming Game and Fish Department personnel (per. comm., Lockman September 1977) following significant snowfalls, at least during the seven years of fence construction, to determine if there would be potential problem areas where migrating big game would concentrate. This would identify locations where emergency measures would be taken by BLM and authorized WGFD personnel to aid big game movement through fences. A permanent pass or laydown panels would be installed as necessary each year following emergency measures (such as fence cutting) to permit continued access. The personnel would be responsible for opening fence passes following significant snowfalls as well as taking emergency measures along stretches of fence where additional problems may develop. See personal communication with Lockman (September 1977) for suggested permanent pass.

Fences around the Palmer Draw no grazing area would be monitored to identify migration routes taken by wildlife. Cattleguards would be constructed at these points to promote fence crossings by young animals.

Terrestrial Wildlife and Vegetation

Studies would be undertaken in conjunction with ongoing range studies to determine trends for identified endangered or threatened animal and plant species, especially in those areas where Treatment A is utilized. If the

trends indicate that certain of these species warrant protection, limited areas would be set aside to assure their survival.

Aquatic Wildlife and Watershed

Twenty stream channel stability and riparian habitat monitoring exclosures (TABLE 4-6) are proposed as control study areas in allotments or pastures having grazing systems other than those two-pasture alternately grazed systems treated in the mitigation measures section. Each study area would be approximately 1,500 feet by 600 feet in size (21 acres) and would provide intensive study and trend evaluations specific to each allotment, grazing system, and its physical environment.

Items monitored would be primarily related to the physical environment of these areas and would function as a baseline comparison from which to evaluate trend, rates of improvement, or future modifications of the grazing system. These would be natural study areas with no plantings or physical manipulation of the habitat conducted. Evaluations are anticipated to include channel stability trends, attainment success of the estimated channel stability improvement potentials, water quality trends, sediment and bedload dynamics, soil compaction, vegetative species diversity and natural growth rates, degree of use by wildlife, natural reproductive or reestablishment potentials, and natural vegetative succession in the riparian zone.

The selected sites as proposed have been chosen in consideration of national resource land status, type of grazing systems, present channel stability, riparian zone condition, and anticipated areas of significant change as a result of the proposed grazing systems. The allotments, pastures, and general locations for these monitoring areas are listed in TABLE 4-6.

TABLE 4-6

PROPOSED RIPARIAN HABITAT AND STREAM CHANNEL STABILITY MONITORING SITES

Allotment and Pasture	Stream/Riparian Area	Approximate Location	Approximate Area (Acres)
Prospect Mountain			
Pasture 1	Big Sandy	Station-100	21
Poston			
Pasture 1	Big Sandy	S-90	21
Little Sandy-Little Prospect			
Pasture 1	Rollins Bottom	S-4	21
	Little Sandy River	S-50	21
Pasture 2	Little Mitchell Slough	S-3	21
	Little Sandy River	S-41	21
	Little Sandy River	S-33	21
Pasture 3	Dry Sandy Bottom	S-15	21
Fish Creek			
Pasture 1	Fish Creek	S-8	21
Continental Peak			
Pasture 1	Oregon Slough	S-3	21
Reservoir			
Pasture 1	Big Sandy River	S-73	21
Pacific Creek			
Pasture 1	Jack Morrow Creek	S-9	21
Pasture 2	Pacific Creek	S-27	21
Pasture 3	Pacific Creek	S-10	21
Steamboat Mountain			
Pasture 2	Jack Morrow Creek	S-27	21
Little Colorado			
Big Sandy Use Area			
Pasture 1	Big Sandy River	S-13	21
Pasture 2	Big Sandy River	S-24	21
Pasture 3	Big Sandy River	S-20	21
Green River Use Area			
Pasture 1	Green River	S-169	21
Pasture 2	Green River	S-156	21
SANDY AREA TOTALS	20 Monitoring Study Areas	Acres	420

TABLE 4-7

SUMMARY OF MITIGATING MEASURES BY RESOURCE

Impact	Mitigating Measure(s)	Reduction Due to Mitigation
Soil and Water Resources		
1. Headcutting and rill and gully erosion would occur along access roads and fence lines due to soil compaction by livestock, wildlife, and vehicles.	9	Additional headcutting and erosion would be reduced by approximately 70-75% after the water developments are in use.
2. Severe and heavy compaction due to trampling in the Little Colorado, Red Desert, and Sands Allotments would increase by 19,244 acres.	12	The severe and heavy compaction would be reduced by 31% on 6,037 acres.
3. Reservoirs developed in coarse textured soils could increase erosion and sediment production because of their highly erosive nature.	14	Erosion and sediment production would be reduced 75-95%.
4. Headcutting would occur below all of the proposed earthfill reservoirs due to increased channel slope. Loss of vegetation through construction and use of earthfill reservoirs would increase sheet erosion.	14 15	Off-channel pit reservoir construction would eliminate the impact. Fencing and 10-year storm design would reduce headcutting for earthfill reservoirs by 75% and sediment from sheet erosion by 89% or 6.72 tons/year/reservoir.
5. Pit reservoirs would increase sheet erosion and sediment yield due to increased slope gradient and livestock use.	14 15	Sediment yield from excess material would be eliminated Sheet erosion would be reduced by approximately 64% or 400 tons/year.
Vegetation		
1. Heavy utilization around waters would reduce the vegetation around each water development.	12	Heavily grazed acres would be reduced by 6,037 acres within the Little Colorado, Red Desert, and Sands Allotments. Utilization would be reduced from 70-90% to 60-80%.
2. Effectiveness of grazing systems would be reduced and monitoring studies would be less reliable without an effective system of identifying unplanned/unauthorized livestock use.	6a	Actual use data would be made much more reliable. Identification of unplanned/unauthorized use would be much easier.
Terrestrial Wildlife		
1. Fences restrict big game movement and contribute to mortality.	3 16 22 32 33	Mortality of wildlife would be reduced as follows: Pronghorn Antelope - 3% Mule Deer - 10-20% Elk - 5% Moose - 2-5%

TABLE 4-7 (continued)

SUMMARY OF MITIGATING MEASURES BY RESOURCE

Impact	Mitigating Measure(s)	Reduction Due to Mitigation
2. Increased livestock (cattle) use around existing, proposed and perennial waters would cause increased mortality to nesting waterfowl, sage grouse, and other small birds and animals due to trampling.	4 16 21	Trampling would be reduced by 95%. Nesting and breeding habitat would be improved on 700-800 acres.
3. Winter moose mortality could occur as a result of livestock use of riparian areas.	4	Mortality of moose would be reduced by 5%.
4. Locating water developments close to prairie dog towns could reduce endangered species populations (black footed ferrets) by dislocating and causing mortality to the prairie dogs.	18	Impact would be eliminated
5. Constructing proposed developments between March through June near peregrine falcon eyries would disturb the breeding and nesting and could cause increased mortality.	30	Impact would be reduced by 90%.
6. Wells that would be shut off or built so small animals would not be able to effectively use them would cause mortality.	21	Impact would be eliminated.
7. Providing readily available water for summer wildlife use in a pronghorn antelope crucial winter range would cause mortality from loss of winter forage.	17	Impact would be eliminated.
Aquatic Wildlife		
1. Livestock grazing in riparian areas would reduce the quality of the fisheries habitat due to trampling.	4	The fisheries habitat of approximately 26 miles of stream would improve in quality. This is approximately 5% of the spawning habitat and 12% of the resident habitat, thus there would be a 15% increase in game fish population in the area.
Wild Horses		
1. Wild horses in allotments where control of livestock would be controlled by water would be impacted by lack of water which could result in increased stress.	2	Impact would be eliminated.

TABLE 4-7 (continued)

SUMMARY OF MITIGATING MEASURES BY RESOURCE

Impact	Mitigating Measure(s)	Reduction Due to Mitigation
2. Pasture gates would be closed in the Green River and between the Green River and Farson Use Areas during grazing seasons, thus impacting wild horses by restricting free movement and causing injury.	3	Impact would be reduced by approximately 75% for wild horses for the remainder of the year after the end of the grazing season. Negligible benefit to wildlife would be realized.
3. Until wild horses get acquainted with the fences and cattleguards, they could be injured by running into them.	22	Reduced injury to wild horses would be 30%-70% effective as a result of this measure.
Paleontological and Cultural Resources		
1. Livestock trampling leads to erosion of archeological and historical sites, breakage of artifacts, and destruction of trail traces.	5 6 10 16	Impact would be reduced by 75%.
2. Livestock trampling and vehicle access to water developments and along fences leads to erosion of potential undiscovered archeological and historical sites.	8 11 25	Unknown archeological sites would not be destroyed.
3. Livestock and vehicle movement along fence lines would cause breakage and loss of artifacts.	25	Impact would be reduced by 95%.
4. Fence crossings of historic trails would visually distract from the historic setting.	8 26 27 28 29	Fence relocations would eliminate 75% of the visual impact on trails and 95% of the trampling damage. Cedar posts and pole fences would reduce the visual impact of fences crossing the trails by 25%.
Visual and Recreation Resources		
1. Fences would be a barrier to snowmobiles and other winter sports activities.	3	Impact would be reduced by about 6%.
2. Proposed projects would contrast with the natural character of the landscape.	7 13	Impact would be reduced by an undeterminable amount.
3. Two reservoirs in the Continental Peak Allotment exceed the visual contrast objectives for Class II.	19	Impacts would be reduced to within the Class II objectives*.

*See Chapter 2 visual resources section for a definition of visual class objectives.

TABLE 4-7 (continued)

SUMMARY OF MITIGATING MEASURES BY RESOURCE

Impact	Mitigating Measure(s)	Reduction Due to Mitigation
4. Pipeline con..truction lines where vegetation was removed would contrast with the surrounding natural landscape exceeding the VRM Class II objectives* for the area.	20	Impact would be reduced to within the Class II objectives.*
5. Fences located on top of ridges would increase visual contrast through skylining.	22 24	Impact would be reduced to within the VRM Class II objectives.*
6. Livestock grazing in campgrounds would impact the recreation use by diminishing the experience and causing a health hazard.	23	The recreation experience would be improved for 2,933 annual visitor days use and the health hazard would be reduced by approximately 90%.
7. Fencing would impact the recreation visitor by requiring them to open and close gates.	34	Impacts to hunters would be reduced by 20% and those to sightseers by 80%.
Livestock Grazing		
1. Livestock operators would have to lamb sheep on range other than that where they traditionally lamb within the Sandy area or at a later date. This would be an inconvenience to the operators of having to change traditional lambing operations.	1	Impact would be eliminated.
2. Only about 47% of the Little Colorado, Red Desert, and Sands Allotments (1,087,183 acres) would be used during the summer.	12	An additional 75,536 acres (7% of these allotments) of forage would be made available to livestock during the summer.
3. Frequent gathering and counting of cattle would produce stress, inconvenience and irritation.	6a	Frequent stress of gathering and counting would be replaced by one time stress of ear-tagging for cattle and corraling and counting for sheep.
Forestry		
1. Livestock grazing in clearcut or selective areas that would be cut in the future would destroy establishing seedlings.	31	Impact would be eliminated.

*See Chapter 2 visual resources section for a definition of visual class objectives.

CHAPTER 5

ANY ADVERSE IMPACTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

The adverse impacts identified in Chapter 3 that were either unmitigated or only partially mitigated by the measures listed in Chapter 4 are identified in this chapter. These impacts are termed "unavoidable adverse impacts,"or those that would occur if the Bureau implements the proposed action as modified by the mitigating measures.

SOILS

Areas around pit reservoirs would not be fenced and would continue to supply on-site sediment (sheet erosion) to the water-holding area due to loss of vegetation from construction and livestock use at the rate of 5.1 tons per year per pit. The amount of sediment entering any earthfill reservoirs that could not feasibily be replaced by pit reservoirs would be reduced to 0.86 tons per year per reservoir by fencing. Total sediment contributed by sheet erosion to both pits and reservoirs is estimated to be 222 tons per year. While this is relatively insignificant when compared to the total sediment for the Sandy area, it is significant as it relates to reservoir and pit life expectancy.

Watering facilities would receive adverse impacts around their perimeters by domestic and wild animals. Total adverse impacts to soils would be minimal due to the small area involved (less than 1% of the Sandy area). However, total compaction for the Sandy area that cannot be mitigated is estimated to be 58,613 acres in the short term and 81,178 acres over the long term. This represents a 10,445-acre decrease in the short term and 12,117-acre increase in the long term over the present situation. Increased soil compaction would result in a loss of soil productivity, increased runoff, and sheet erosion. Anticipated increases in vegetal ground cover Sandy area-wide would help to offset this impact. Loss of soil productivity would impact water quality, vegetation production, and aquatic habitat.

WATER RESOURCES

An estimated 40% of the long-term, ten-year storm runoff would still occur due to soil compaction by livestock under the proposed action. Unavoidable sediment yield is unknown but would be proportionate to the runoff values.

Under the proposed action the channel stability rating over the present situation would be reduced by 1.6 channel stability rating points. However, the unavoidable adverse effects of the proposed action would be 8.4 channel stability rating points due to livestock grazing along streams. This impact would not apply to Palmer Draw. Unavoidable impact to bank erosion is unknown but would be proportional to the effects on channel stability.

Unavoidable salinity impacts are unknown but would be proportional to sediment yield and runoff.

Livestock grazing along perennial streams would have an unavoidable effect on fecal coliform levels directly associated with national resource land (NRL) grazing. However, no information is available on the relationship of livestock grazing on NRL to the concentration of fecal coliforms in perennial streams in the Sandy area.

Earthfill reservoirs could have an unavoidable impact on sediment yield if a storm event occurs larger than a ten-year storm. Reservoir spillways would be designed to carry a ten-year storm without headcutting.

VEGETATION

Forage production is expected to increase to the long-term objectives of Chapter 1 under all grazing systems and all allotments except the Gold Creek Allotment, where production for cattle would not meet the objectives by approximately 301 AUMs (TABLE 3-15). Therefore, licensees would not be able to utilize the 301 cattle AUMs. Licensees would be able to increase livestock use up to 5,189 AUMs in the Gold Creek Allotment.

With the grazing systems keyed to the phenological development of grasses, slow recovery of shrubs (predominantly existing willows) found in meadow types would be expected and would be an unavoidable, long-term adverse impact affecting the aquatic habitat. No significant new willow establishment would be anticipated for the long term, also affecting the aquatic habitat.

Six unavoidable impacts on vegetation on the 12,915 acres of national resource land in custodial pastures would be caused by trampling from heavy concentrated use. This would (1) destroy seedlings; (2) eliminate all litter accumulation; (3) would not allow new growth time to mature; (4) meadow vegetation would receive between 70% and 100% utilization in the custodial pastures; (5) willows would be quickly grazed or trampled to where only the very old plants would survive, and (6)

vigor would remain at approximately 60% of full development with implementation of a proper stocking rate and season of use.

Production in the Palmer Draw no grazing area should decrease by 10% area wide over the long term as fewer new plants would become established.

Construction of water facilities would permanently destroy approximately 266 acres of vegetation.

Trailing damage to vegetation along fences and vehicle damage to vegetation where project maintenance access routes are located would be an unavoidable adverse impact since these activities are expected and necessary if the proposed action were implemented. Trailing damage along fences would destroy approximately 268 acres of vegetation. This impact would be more widespread for approximately five years or until the livestock, wildlife, and wild horses become accustomed to the new area of use and establish trails. An unavoidable impact of vehicle damage to the vegetation while conducting maintenance operations and maintenance inspections of existing projects would occur over the entire long-term period. This impact would be on approximately 62 acres for the 62 miles of access roads servicing the water developments.

WILDLIFE

Terrestrial

Pronghorn Antelope and Mule Deer

Extreme winter weather, such as that which occurred during the winter of 1971-1972, or drought conditions would complicate the identified impacts.

Using three-wire fences instead of four-wire fences would reduce the impact of restricted pronghorn and deer movement (3% for pronghorn and between 10 and 20% for deer) that contributes to mortality in crucial winter habitat. The carrying capacity of crucial winter habitat for pronghorn and deer within the Sandy area would be expected to decrease by approximately 3% and 10%, respectively, during the short term and would continue over the long term. Therefore, the pronghorn population would be expected to stabilize at about 3% (300 animals) below the desired level of 9,900 animals. The deer populations would be expected to stabilize at approximately 10% (700 animals) below the desired population of 7,400 animals.

Additional forage and water developments would tend to increase populations; however, existing migration patterns between traditional summer and winter habitat for pronghorn and deer would be disrupted by fences. The fences would restrict animals from migrating to crucial winter habitat, thus confining them in smaller ranges and increasing winter mortality. This would offset any potential population increase. Population fluctuations would be expected to be even more dynamic (increasing and decreasing) because of this relationship.

Grazing systems using Treatments A, B, and E in crucial winter habitat would result in increased livestock use in wet meadows and adjacent to water developments; this would decrease the carrying capacity for pronghorn and deer. Using Year 1 as an example, approximately 21% (106,893 acres) and 39% (211,637 acres) of the pronghorn habitat and 35% (98,232 acres) and 46% (165,913 acres) of the deer crucial winter habitat would receive Treatments A and B, respectively. Increased livestock use (predominantly cattle) during Treatments A and B would also increase use of competitive forage and shrub species (predominantly willow) and could result in short-term depletion of crucial winter habitat, especially during the first year of implementation of an allotment. This would reduce carrying capacity and contribute to the population decreases.

Elk

The proposed action is not expected to have an adverse impact on elk. Populations would be expected to be maintained at the current or desired level (approximately 1,165 animals). There could be short-term impacts, especially the first year or two of implementing grazing systems using Treatments A and B. The treatments would allow livestock use of browse which elk depend upon. Actual amounts are unknown; however, this could impact elk crucial winter habitat during a severe winter.

Moose

Populations would be expected to increase approximately 5% (3 animals) due to the modified fence designs and exclosures (mitigating measures). The population would stabilize at about 59 animals which is 19% (14 animals) below the desired population level established by the Wyoming Game and Fish Department. Although unavoidable impacts on the crucial winter habitat are unknown, moose are more dependent on the riparian and wet meadows, especially willows, than any other wildlife species. For this reason, any alteration in the riparian ecosystem could cause a decrease in populations.

Sage Grouse and Waterfowl

Sage grouse and waterfowl populations are unknown, but they would be expected to be maintained at the current levels for sage grouse and decrease for waterfowl for the short term. Both would increase over the long term due to mitigation of impacts. The amount of increase is unknown. The short-term impact would be caused by increased livestock use (mostly cattle) along standing and flowing waters (1,900-2,000 acres Sandy area-wide), wet meadows (unknown), and springs (unknown) that would increase disturbance to (trampling by livestock) and abandonment of nests by both sage grouse and waterfowl. Combination of the exclosures in the proposed mitigating measures would reduce the impact over the long term. This would increase populations on ap-

proximately 1,000 acres of the standing and flowing waters of which about 200 acres are riparian habitat (about 10% of the total known riparian area). The impact would be reduced proportionally for the unknown riparian areas.

Endangered Animals

Peregrine Falcons. There would still be an unavoidable adverse impact to the peregrine falcon, although 90% of the impact of constructing range improvement near falcon eyries during breeding and nesting would be mitigated. Human activity such as moving livestock into allotments and pastures and maintenance of range improvements would still disturb them.

Black-Footed Ferret. Proposed mitigating measures are designed to eliminate the impacts to the ferret by protecting the prairie dog towns. Removal of the prey species could impact the ferrets where they may occur.

Aquatic

A decrease in the condition of an estimated 10% of the spawning habitat and 20% of the resident habitat would still occur over the long term after mitigation. Approximately 85% and 68% of the spawning and resident habitat, respectively, would remain in about the same condition as presently exists for approximately 300 miles of streams with habitat within the Sandy area. The slow recovery of existing willows and no new willow establishment would hamper the development of the aquatic habitat by beaver. Willow are necessary to provide sufficient food to maintain active beaver populations which maintain the aquatic habitat that is necessary to satisfy the winter survival requirements of fish. Decreases in game fish populations for the entire Sandy area outside the aquatic management exclosure (mitigation) are estimated to stabilize at about 25 to 35% lower than the existing population levels, which would impact recreation use. The anticipated increases in fish populations in the aquatic management areas, however, should offset these losses. Spawning and resident habitat in custodial pastures would decrease by about 40 and 50%, respectively, and game fish populations in the pastures would decrease by approximately 50 to 70%.

WILD HORSES

Unavoidable adverse impacts to the horses are difficult to quantify because of the lack of knowledge of the effects of grazing management and fences on them; therefore, the following ranges are provided as a measurement of the significance of the unavoidable adverse impact: minimal (low)--the impact(s) would or could affect less than 30% of the horse population; medium—the impact(s) would or could affect between 30% and 70% of the horse population; high—the impact(s) would or could affect more than 70% of the horse population.

Control and distribution of livestock in unfenced areas would be by shutting off water and herding livestock to adjacent pastures. Whether wild horses would move with livestock as proposed in Chapter 4 or return to traditional watering holes is unknown at this time. The unavoidable impact would be minimal to the wild horses as it is felt a majority of the horses would respond to herding and remain in the new pastures.

Free movement of horses would still be highly impacted. Movement would be restricted by fences around the management areas, and some unavoidable injuries (minimal) would still likely occur as horses attempt to cross fences and cattleguards.

Proposed water developments could still cause a minimal impact by increasing competition of livestock with wild horses in areas previously unused by livestock. This would confine the wild horses' "home range,"although this is estimated to be a minimal unavoidable impact.

CULTURAL RESOURCES

Unavoidable adverse impacts to the cultural resources are difficult to quantify because of the lack of knowledge of the effects of grazing management and fences on them; therefore, the following ranges are provided as a measurement of the significance of the unavoidable adverse impact: minimal (low)--the impact(s) would or could be small or slight (less than 15% effect on cultural values); medium—the impact(s) would or could be obvious (between 15% and 50% effect on cultural values); severe—the impact(s) would or could be from significantly greater than 50% to complete destruction of cultural values.

The displacement of artifacts from increased sheet erosion would still occur and would result in a medium unavoidable impact. Breakage and relocating of artifacts from trampling around heavy concentration areas would still have a severe impact on unknown sites not discovered during archeological clearance. Grazing treatments A, B, D, and E would still have medium to severe impacts on unknown cultural sites. Construction of fences would still have minimal (approximately 5%) impact on unknown sites.

Severe damage to subsurface sites not discovered by the project survey could occur during construction of water facilities. In addition, any headcutting near reservoirs would damage any subsurface sites that would be present. The portion of those sites damaged would be permanently lost. The remainder of the site could be salvaged, but this would still be an unavoidable impact because excavation destroys a site and eliminates its availability to more sophisticated future research designs and techniques.

Some severe unavoidable damage to archeological sites would occur from both trampling by livestock and the resultant erosion it would cause during the short term. Access along fences and to projects would also have a medium impact on cultural sites by exposing them to the public, which increases the potential for vandalism.

The construction of fences and water developments (including resultant access via two-track trails) would have a medium impact by reducing visual integrity of any undiscovered archeological or historical sites which they are close to by injecting a visual intrusion upon the site. The grazing of livestock, predominantly cattle, would also cause a visual impact upon archeological and historical sites which date before 1880 as livestock were not common to this area before that time. The loss of the visual integrity or destruction of a site due to construction activities would change severely the site's historic setting and thereby affect its possible inclusion in the National Register of Historic Places.

Fences would still reduce the visual integrity on historic trails. Approximately 25% of this impact would remain after mitigation.

VISUAL AND RECREATION RESOURCES

Unavoidable adverse impacts to the visual and recreation resources are difficult to quantify because of the lack of knowledge of the effects of grazing management and fences on them; therefore, the following ranges are provided as a measurement of the significance of the unavoidable adverse impact: minimal—accidents not likely to occur; moderate— accidents could occur but would not be common; significant--accidents are likely to occur.

Use of wooden posts and reflectors (mitigating measure number 24) to make fences more visible to wild horses and wildlife would create adverse visual impacts. Fences would then not meet the Class II objectives (see Chapter 2 visual resource section for a definition) and would be visible from adjacent roads. Proposed water development facilities such as stock tanks, pumps, and buildings would also be visual intrusions and unavoidable adverse impacts. No other significant visual impacts are anticipated.

Decreased big game wildlife populations and game fish populations would decrease hunting and fishing success. Fishing success over the long term would decrease along streams outside of the aquatic management exclosures as fish populations decrease; however, fishing success within the exclosures would increase as fish populations increase. Over the Sandy area, it is anticipated that very few, if any, hunter-days or fisherman-days would be lost due to the decreased hunting and fishing success. The rate of success is important only in terms of the quality of the experience. People would continue to hunt and fish as long as there were animals and fish. Fences would also still impose a minimal to moderate adverse impact to snowmobile use, floatboating, and cross-country skiing and increase the potential for accidents.

LIVESTOCK GRAZING AND FARMING

Cattle would congregate in the short term along fences where they traditionally migrate to higher or lower elevation ranges (depending on season), resulting in temporary unavoidable adverse impact reductions in weight gains by up to 10%. Over the long term, as cattle become accustomed to the new management systems, this impact would be eliminated.

An approximate $91,000 annual maintenance cost of the proposed projects would be incurred by the livestock operators. There would also be increased costs to the operators involved in livestock management (moving livestock between pastures). The increased supervision costs are unknown but are anticipated to be at least 50% higher than presently incurred.

A decrease over the short term of 11,553 AUMs presently available to livestock would occur should the proposed action be implemented. These AUMs would be reduced due to range suitability, allotment boundary adjustment, and wildlife and wild horse competitive reservations.

Livestock weight losses would still be experienced with Treatments B, D, and E.

Livestock rotation between pastures in the Red Desert, Bush Rim, and Continental Peak Allotments and the Farson Use Area of the Little Colorado Allotment would still cause unavoidable adverse impacts of weight loss to livestock as forced movements would increase stress, and livestock would have to adjust to the new pasture and forage. The amount of weight loss is unknown.

Fences would still restrict free movement of cattle and cause them to congregate at fences; that could result in additional weight loss. Sheep would only be impacted during lambing as ewes could be temporarily separated from lambs where they graze next to a fence.

Two livestock operators who presently use individual use pastures I-28 and I-30 (see MAP 8-1, Chapter 8, Alternative 1) would still lose their control (flexibility in operation) over these areas as they would become part of the Prospect Mountain Allotment should the proposed action be implemented.

CHAPTER 6

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

For the purposes of this analysis, short term is defined as the first 23 years following implementation of the proposed allotment management plans (AMPs). Long term is the time beyond that period.

The proposed action (after mitigation) would implement improved grazing management on 98% of the acres in the Sandy area. Two percent of the area would be placed under custodial management and no grazing status. The 970 acres of the no grazing area would be reserved for wildlife use.

In the custodial management and no grazing areas, there would not be any range improvements; however, in the intensively managed areas, there would be approximately 923 acres disturbed during the first eight years by project construction. Some loss in productivity would occur on these acres.

SOILS

The trend of the soil resource of this area would be toward a more stable productive form. By the end of the short-term period (23 years), most of the benefits of the proposed systems should be realized. These primarily would be reduced sheet and wind erosion rates. Long-term benefits would be those of increased soil fertility and available water capacity.

By the end of the short term, all of the proposed allotments, except for the Farson Use Area of the Little Colorado Allotment and for the Gold Creek Allotment, would have realized the optimum vegetative state under the proposed system. A stable soil state would have been obtained with a trend toward an even more productive state.

The vegetation's response anticipated through the proposed grazing systems would be a positive long-term benefit to the soils. Increased vegetal cover and litter accumulation at the soil surface would mean increased water entering the soil profile, thus increasing soil productivity. Vegetal cover protects the surface from the destructive action of rainfall. It also traps the water in vegetal litter, allowing for increased time for it to enter the soil. The overall effect of these two actions are increased soil porosity, increased humification of ground litter, and increased water-holding capacity. As these processes continue into the long term, increased soil fertility would be expected. As more water enters the soil, soluble salts would be leached deeper into the soil, thus minimizing their toxic effects on plants and increasing the soils' ability to produce.

Neither short-term nor long-term benefits would be realized on some of the soils of the Sandy area. This involves approximately 109,000 acres of the very steep soils (Mapping Units 132, 233, and 333) and approximately 221,000 acres of the highly saline alkaline soils (Mapping Units 110, 111, 113, 115, and 126). Only modest increases in vegetation are expected on these soils in the short-term use, and their long-term productivity should remain essentially unchanged.

WATER RESOURCES

The increased livestock use resulting from increased forage availability would increase consumption, excluding evaporation, at the end of the 23-year timeframe by an average annual rate of 80 acre-feet per year above the existing level.

Evaporation losses from reservoirs would increase approximately 48% (418 acre-feet) with the increased water developments. The increased water developments would also improve livestock distribution around water developments and along streams, decreasing compaction, improving water quality, and decreasing runoff by approximately 29% (TABLE 3-8) since an additional 101,849 acres (from 918,463 acres to 1,020,312 acres) would be available to livestock. Decreases in sediment yield would be proportionate to the runoff. Surface storage of water would also increase 102% (638 acre-feet) with the increased water developments.

Bank erosion would remain unchanged during the first few grazing cycles but would decrease in the long term since livestock would be distributed more evenly over the pastures grazed.

Livestock feces deposited along streams would be a potential source for introducing pathogenic bacteria into streamflow, both in the short term and long term. Pathogenic bacteria could then be picked up during primary contact in recreation or consumption of untreated water.

SHORT TERM VS. LONG TERM

VEGETATION

The proposed grazing systems would accelerate plant vigor recovery and give more protection while allowing for increased removal of forage by livestock and wildlife. Wild horses would not be affected since populations would be maintained at approximately 800 horses. Some vegetation would be lost to project construction on approximately 930 acres; however, the grazing system provided for by the projects would result in an overall increase in vegetation production for the 23-year timeframe of approximately 917,259 AUMs (TABLE 3-16).

Long-term benefits would include increased ground cover for watershed protection, increased vegetation for wildlife food and cover (493,816 AUMs), increased forage for wild horses (75,337 AUMs), and increased forage for domestic livestock (348,106 AUMs).

Slow recovery of existing willows and no significant new willow establishment would be anticipated for the long term because of increased cattle use in riparian areas. This would impact the aquatic habitat.

WILDLIFE

Terrestrial

Big Game

Extreme winter weather or drought conditions would complicate or intensify identified impacts to long-term productivity. Big game losses during the winter of 1971-1972 ranged between 43% and 75% of the estimated herd population within the Sandy area. Today's Sandy area is considered to have relatively little fencing; thus, the proposed fencing could result in big game losses of over 75%.

The proposed 449 miles of three-wire fence (with mitigation, Chapter 4) would form unnatural barriers, restricting movement to crucial winter habitat. The impacts and injuries that would result from the three-wire fences would occur for the entire 449 miles of fence, while those related to the four-wire fences would be eliminated except for the remaining 87 miles of fence. This proposed fencing is required to facilitate, over the long term, management of increased livestock use of 28,503 AUMs. Mortality would be expected until animals adjust to the fences. Pronghorn and deer populations would be expected to stabilize at approximately 300 (3%) pronghorn and 700 (10%) deer below the desired population targets of 9,900 and 7,400 animals, respectively, that have been established by the Wyoming Game and Fish Department.

Projected increases in forage production for wildlife (493,816 AUMs) would enhance the big game habitat. This would at least maintain the existing pronghorn, deer, and moose populations and slightly increase elk populations.

Other Game Species

Livestock concentrations, especially cattle around riparian areas, along streams, and near reservoirs that would not be fenced, would cause trampling of the nests and young of sage grouse and waterfowl. Those areas that would be fenced would enhance the survival of the young, increasing populations to offset those losses in unfenced areas.

Nongame Species

Livestock concentration and trampling impacts identified for sage grouse and waterfowl would be the same for nongame species in unfenced riparian areas. Populations over the entire Sandy area are anticipated to increase, although it is unknown to what degree, due to long-term increases in forage production.

Endangered Species

Increased populations of nongame species (available prey) would benefit, which in turn would promote the hunting success and welfare of the peregrine falcons and black-footed ferret.

Aquatic

A decrease in the condition of an estimated 10% of the spawning habitat and 20% of the resident habitat outside the aquatic management exclosures would still occur over the 23-year timeframe for the 300 miles of streams with habitat in the Sandy area. The slow recovery of existing willows and no new willow establishment would also contribute to decreasing the aquatic habitat condition by (1) reducing the channel stability; (2) not providing sufficient food to maintain active beaver populations, and (3) impairing the aquatic habitat created by beaver which is necessary to satisfy the winter survival requirements of fish. Game fish populations outside of the exclosures are estimated to stabilize at about 25% to 35% lower than the existing population levels which would impact recreation use. The anticipated increases in game fish populations within the exclosures should offset these losses.

WILD HORSES

The wild horse numbers would not be affected since the numbers would be controlled artificially by removing excess horses from the area. The quality of habitat for the first few years would be decreased due to construction of fences and restriction of the horses to fenced boundaries.

The long-term productivity of the area's wild horses would be affected little once the horses adjusted to the fence in this area.

CULTURAL RESOURCES

The inventory and study of cultural resources directly affected by the proposal would provide a limited increase in scientific knowledge of the area. For the first twelve years, increased erosion would lead to a greater loss of known and unknown cultural resources in the allotments shown in TABLE 6-1.

Construction of proposed range improvements (fences and waters) and livestock trampling in heavy concentration areas would lead to loss of the cultural values, of archeological sites not discovered during construction, of the visual integrity of historic trails and sites, and/or physical damage to the trails and sites.

After construction of the range improvements is completed, there would be less erosion, possibly leading to fewer losses of cultural resources.

VISUAL AND RECREATION RESOURCES

The visual impacts of using wooden fence posts and reflectors would increase the visual contrast of those areas where this occurs. Increased vegetation would improve the overall quality of the visual resource of the Sandy area.

Visitor use would increase in the Sandy area due to improved vegetation conditions in the heavily used recreation areas. A carrying capacity for each recreation site (number of visitors at one time a site will accommodate before reducing the quality of the recreation experience) has not been established. It is anticipated, however, that recreation use would not exceed the potential for sites to accommodate use since most use occurs over a widespread area.

The increased livestock (predominantly cattle) use would increase the hazard of soil- and water-borne diseases to recreation users. The degree of the hazard cannot be quantified.

Fishing use along streams where there are no fenced exclosures would decrease proportionally over the long term as fish populations decrease. Fishing use would gradually decline less than 10% when fish populations are practically nonexistent.

LIVESTOCK GRAZING

Livestock operators would take an initial reduction of 24,772 AUMs at the start of the grazing program from 138,047 AUMs. It must be remembered, however, that 64% of the present use is taken in nonuse; therefore, the actual numbers of livestock would increase. The 24,772 AUMs would be gained back as the vegetal production would increase over the 23-year timeframe; therefore, approximately 166,550 AUMs of use would be authorized. The operators would have increased responsibility for maintaining proposed range improvements (approximately $91,210 annually) and herding livestock between pastures and water developments. This could necessitate hiring new employees.

SOCIOECONOMIC CONDITIONS

There would be an increase in the agricultural employment as a result of the proposal; however, the magnitude is so small when compared to a regional or county basis, it is insignificant.

There would be a loss in value to the average ranch unit due to the initial reduction in qualified AUMs; however, some would gain needed flexibility and increased annual income.

TABLE 6-1

INCREASED EROSION LEADING TO LOSS OF KNOWN AND UNKNOWN CULTURAL RESOURCES

Allotment	% Increase of Intensive Livestock Use	Allotment	% Increase of Intensive Livestock Use
Fish Creek	20	Continental Peak	13
Gold Creek	11	Pacific Creek	8
Little Colo.	8	Sands	4
Red Desert	62*	White Acorn	20
Bush Rim	18	Pine Creek	8

* This increase would result in an estimated 10% loss of the archeological sites in that allotment.

CHAPTER 7

ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

Irreversible or irretrievable commitments of resources through the implementation of the proposed action are noted as follows and would result in either irreversible curtailment of availability or the irretrievable loss of a specific resource or resource base. Human resources, monies, fuel, and materials used to implement the proposed action are considered to be irretrievable.

SOILS

Concentrations of livestock, wildlife, and vehicle use in the vicinity of water developments and along fencelines and streams resulting from implementation of the proposed action would result in irretrievable soil losses through displacement by wind or water erosion, causing a depletion of the vegetal cover in those areas. This would be especially serious in riparian zones which would salt out through increased evaporation directly from the soil and result in loss of productivity.

The degree of soil loss is not quantifiable as it is dependent upon variables such as vegetal cover, soil compaction, percent of slope, length of slope, soil texture, moisture, and intensity of use. The proposed range developments would remove the vegetation on 923 acres, resulting in increased soil erosion on these areas throughout the 23-year timeframe. This erosion would be negligible for the Sandy area because of the small area involved.

With the proposed action, an estimated 58,613 acres would be compacted during the short term and 81,178 acres over the long term. Soil loss from these acres cannot be determined.

WATER RESOURCES

Livestock grazing on NRL would consume 152 acre-feet of water per year over the long term. Evaporation losses from the proposed livestock reservoirs and pits is estimated at 418 acre-feet per year (TABLE 3-7). The consumption of water and loss through evaporation would be an irretrievable commitment of the resource over the long term but is not considered irreversible.

Sediment yield and salinity for the intermittent drainages would increase proportionally to the 16% projected increase in runoff for the Red Desert Allotment. This increase would be contained within the Great Divide Basin, which is a closed basin. The increase would be irretrievable.

When the ten-year storm is exceeded, headcuts would occur below earthfill reservoirs resulting in increased sediment yield and higher salinity levels in affected streams. It is unknown how much sediment or salinity would be increased, although this would be an irretrievable commitment. This increase for a ten-year event may be more than offset by the reduction of sediment yield and salinity during the other nine years. The reservoirs would also reduce peaks for storms with greater than the ten-year design and therefore reduce their natural erosive power. Thus, the reservoirs may have a net benefit.

VEGETATION

The vegetation lost from construction, use, and maintenance of the proposed range improvements would remove 923 acres from production for the long term. This is considered to be an irretrievable commitment of the vegetation resource although not irreversible. These disturbed areas may be closed to use and rehabilitated by proper seeding practices.

WILDLIFE

Irretrievable commitments of wildlife resources would be related primarily to declines in quality or productivity of habitat, often reflecting on conditions in aquatic and riparian areas. Because of their high appeal to livestock, riparian areas (approximately 2,000 acres of the known wet meadow vegetation type) would be expected to experience intensive utilization and site-specific impacts resulting in a depressed habitat condition for wildlife species.

Projected decreases in wildlife populations are considered irretrievable but not irreversible since wildlife is a renewable resource. Pronghorn antelope populations would decrease by approximately 3%, and mule deer by 10%. The remaining species of terrestrial wildlife are anticipated to remain at about the same population levels.

Increased livestock concentrations along unfenced portions of streams would cause slow recovery on existing willows or no new willow establishment. This would

result in decreased aquatic habitat conditions. It is anticipated that 10% of the spawning habitat and 20% of the resident habitat would be decreased. Game fish populations would be decreased by 25 to 30%. Unlike terrestrial organisms, aquatic animals are totally constrained to their immediate habitat; therefore, anything that reduces the quality of the habitat would decrease populations. The anticipated decrease of fish population would be irretrievable, but it is not considered irreversible since the streams could be stocked with fish. The loss of aquatic habitat, on the other hand, is considered irreversible since once the habitat is degraded, a natural return to a reproductive condition takes many years (more than 23 years) under ideal conditions. Artificial restoration is both expensive and difficult to achieve.

WILD HORSES

Loss of the free movement of horses (the ability to roam wild and free over their existing range) would be an irretrievable commitment, but not an irreversible commitment.

CULTURAL RESOURCES

The irretrievable degradation of historic trails would be possible because of increased human use and access development associated with project construction and management of cattle. The development of proposed range improvements would be a visual intrusion upon the archeological sites, possibly affecting their eligibility for inclusion on the National Register of Historic Places. Construction of range improvements may lead to the discovery of buried archeological or historical sites, which would necessitate excavation of the sites as a salvage measure. This could result in an irretrievable loss of information from the disturbed portion of the site. The trampling of archeological sites would result in an irretrievable displacement and alteration of artifacts. This would also result in churning of sites and displacement of artifacts, making it more difficult to interpret the site. Erosion would lead to the displacement of artifacts and the degradation of archeological sites, also making it more difficult to interpret the site. Increased access to the area would result in irreversible vandalism of sites.

VISUAL AND RECREATION RESOURCES

The removal of vegetation and soil from 923 acres disturbed during construction, use, and maintenance, as well as the addition of wooden posts and reflectors, would increase the visual contrast between the disturbed area and adjacent forms, lines, and colors. This would be irreversible. The placement of stock tanks, pumps, etc., at wells would be considered intrusions to the natural landscape and open space values of the area since only 643,523 acres would be unfenced within the Little Colorado, Red Desert, Bush Rim and Continental Peak Allotments of the 2,000,050 acres in the Sandy area.

The decreased numbers of big game and game fish populations would reduce the quality of the recreation experience with reduced hunting and fishing success, although this would have a minimal effect on hunter-days or fisherman-days. The decreased recreation experience is considered irretrievable.

CHAPTER 8

ALTERNATIVES TO THE PROPOSED ACTION

Seven alternatives to the proposed action are addressed in this chapter. They are:

1. Continuation of present use (no action).
2. Discontinuation of domestic livestock grazing.
3. Allow conversions without fences.
4. Livestock grazing program as proposed by the Sandy livestock operators.
5. Reduction of grazing capacity on allotments where excessive soil erosion and poor livestock range condition exist.
6. Site-specific recommendations.
7. Wildlife and wild horse management goals.

In addition to the above alternatives, custodial management was considered for the sixteen allotment management plan (AMP) areas in the proposal. For an allotment to be considered for retention in custodial management within the multiple use concept, it should meet the following criteria: (1) stable conditions, no deterioration of any resource; (2) limited or no conflicting resource values; (3) satisfactory present management; and (4) low percentage of national resource land (NRL) in total land ownership. The allotments do not fit the above criteria and no further analysis was made of this alternative.

Wild horse numbers for each alternative would be reduced to an average of 150 horses in the Little Colorado Allotment and an average of 650 horses in the Red Desert, Continental Peak, and Bush Rim Allotments as proposed in the wild horse management plans. Reservations for wild horses and wildlife would be made in all alternatives with the exception of the no livestock grazing alternative. In that alternative, reservations would not be necessary.

The individual use pastures (see maps located at the end of this chapter) are the same as the custodial pastures under the proposed action except for specific adjustments made for Pasture I-28 (Alternatives 1, 3, and 4) and Pasture I-34 (Alternative 4). Management and use of the individual use pastures would be the same as that identified for the custodial pastures in the proposed action. Since management would be the same, the impacts identified in Chapter 3 for the custodial pastures would be the same specific impacts for the individual pastures. No further analyses or references will be made to these pastures. Management and use of individual use pastures I-28 and I-34 would be similar to the other pastures, therefore impacts to these pastures would be similar and no further analysis is necessary.

Management and use of the proposed no livestock grazing for the 960-acre Palmer Draw area also would be the same as for the proposed action. The related impacts would be the same as those identified in Chapter 3 and no further analysis will be made.

Continued use of the 160 acres of Forest Service withdrawal and 1,590-acre Fish and Wildlife Service withdrawal would be applicable to each alternative. The total checkerboard boundary (southern boundary of the Sandy area) would be fenced with three-strand barbed wire under each alternative except for Alternatives 1, 4, and 7. The only portion of the checkerboard boundary fenced under Alternative 4 would be along the southern boundary of the Lombard Allotment. This fence would be constructed of four-strand barbed wire. No allotment boundary fences are proposed under Alternative 7.

Construction methods and standards for range improvements would be the same as described for the proposed action with the modifications found in Chapter 4 except for mitigating measure 33 (constructing three-wire fences in place of four-wire fences) which would not be proposed under Alternative 4. Other resource management functions would continue to operate within the Sandy area according to approved district programs. The significant impacts for each resource or value affected by each alternative are analyzed.

The analysis of impacts for each alternative is based on the same long-term timeframe (23 years) as the proposed action. Short-term impacts that are not considered significantly different from long-term impacts are not analyzed separately.

A summary of predicted long-term cumulative impacts from implementation of the proposed action and each of the alternatives is shown in TABLE 8-115.

ALTERNATIVE 1-CONTINUATION OF PRESENT USE (NO ACTION)

DESCRIPTION

This alternative for purposes of analysis assumes that the present allotment boundaries, individual use pastures (MAP 8-1, located at the end of this chapter), and class of stock would remain as licensed in 1975. The proposed livestock management for Alternative 1 is shown in TABLE 8-1. Existing temporary conversions from sheep to cattle (shown in TABLE 8-2) would become permanent; however, no additional conversions would be permitted. The existing sheep nonuse would be activated. Nonuse would not be authorized under this proposal except for conservation and protection of the range be-

TABLE 8-1

PROPOSED LIVESTOCK MANAGEMENT UNDER ALTERNATIVE 1

	Acres	Total Livestock AUMs	Number of Areas
Allotment Management	1,957,604	144,401*	18
Custodial Management	39,726	2,289**	34
No Grazing	970	0	1
Federal Withdrawals	1,750	0	3
TOTAL	2,000,050	146,690	54

*Includes Federal, state, and private AUMs (see TABLE 8-2).

**Federal AUMs only (see TABLE 8-4).

TABLE 8-2

PROPOSED MANAGEMENT AND USE LEVELS BY ALLOTMENT UNDER ALTERNATIVE 1

Allotment And Acres	Grazing System	Class of Livestock	Season Of Use	Proposed Livestock Use In AUMs[1]: Federal Land Use: Livestock	Federal Land Use: Trailing Use	Authorized State and Private Land Use	Total Livestock Use[2]	Compet. Reserv. In AUMs[1]	Wildlife[3]: Total Allow. In AUMs[1]	Wild Horses[3]: Compet. Reserv. In AUMs[1]	Total Allow. In AUMs[1]	Total Forage Use In Area[4] In Aums[1]
1. Bar X 6,895	3-pastr. Deferred	Cattle	06/01-10/15	335		437	772					
		Sheep	06/01-10/15	32		38	70					
		Horses	06/01-10/15	7		10	17					
		Total		374	None	485	859	74	519	None	None	1,378
2. Fish Creek 7,237	2-pastr. Deferred Grazing	Cattle	05/16-08/17	666		231	897					
		Total		666	None	231	897	6	55	None	None	952
3. Gold Creek 24,580	3-pastr. Deferred Grazing	Cattle	06/01-11/30	2,375		686	3,061					
		Total		2,375	None	686	3,061	217	971	None	None	4,032
3a. Willow Creek 5,945	Season Long Grazing	Cattle	06/01-11/30	617		143	760					
		Total		617	None	143	760	56	258	None	None	1,018
4. Little Sandy 114,879	Season Long Grazing	Cattle	05/01-11/15	7,783	9	984	8,776					
		Sheep			269	311	580					
		Total		7,783	278	1,295	9,356	877	7,175	None	None	16,531
4a. Little Prospect 70,781	Season Long Grazing	Cattle	05/01-10/01	2,453	11	0	2,464					
		Sheep	05/01-10/15	3,283	105	0	3,388					
		Total		5,736	116	0	5,852	237	1,942	None	None	7,794
5. Steamboat Mountain 38,276	Season Long Grazing	Cattle	05/01-12/15	602		199	801					
		Sheep	07/01-09/12	1,472	100		1,572					
		Total		2,074	100	199	2,373	429	1,344	None	None	3,717
6. Little Colorado 726,956	Season Long Grazing	Cattle	05/01-10/31	5,438		128	5,566					
		Cattle	11/01-12/15	1,747			1,747					
		Cattle	12/15-02/28	1,619			1,619					
		Sheep	04/20-04/30	77		650	727					
		Sheep	05/01-07/15	3,383			3,383					
		Sheep	07/16-08/31	123			123					
		Sheep	09/01-12/15	35,549			35,549					
		Sheep	12/16-01/31	881	On		881					
		Total		48,817	Demand	778	49,595	671	3,279	486	1,800	54,674
7. Red Desert 252,229	Season Long Grazing	Sheep	05/01-07/15	832		1,338	2,170					
		Sheep	07/16-08/31	495			495					
		Sheep	09/01-12/15	16,892	146		16,892					
		Total		18,219	146	1,338	19,703	203	1,067	2,081	5,277	26,047
8. Bush Rim 100,437	Season Long Grazing	Sheep	05/01-07/15	1,495		192	1,687					
		Sheep	07/16-08/31	1,382			1,382					
		Sheep	09/01-12/15	2,022	276		2,298					
		Total		4,899	276	192	5,367	461	1,988	504	1,340	8,695
9. Continental Peak 89,914	Season Long Grazing	Sheep	05/01-07/15	2,735		740	3,475					
			09/17-12/15	4,161	58		4,219					
		Total		6,896	58	740	7,694	212	998	377	1,183	9,875
10. Pacific Creek 203,738	Season Long Grazing	Sheep	05/01-10/31	12,394	240	1,062	13,696					
		Horses	05/01-12/31	689			689					
		Total		13,083	240	1,062	14,385	1,085	5,040	None	None	19,425
11. Sands 112,051	Season Long Grazing	Horses	05/01-12/31	373			373					
		Cattle	05/01-12/15	2,116			2,191					
		Sheep	05/01-06/30	570	100	75	683					
		Sheep	09/13-11/30	1,695		13	1,695					
		Total		4,754	100	88	4,942	550	2,304	None	None	7,246

TABLE 8-2 (Continued)

PROPOSED MANAGEMENT AND USE LEVELS BY ALLOTMENT UNDER ALTERNATIVE 1

				Proposed Livestock Use In AUMs1/				Wildlife3/		Wild Horses3/		
Allotment And Acres	Grazing System	Class of Livestock	Season Of Use	Livestock	Trailing Use	Authorized State & Private Land Use	2/ Total Livestock Use	Compet. Reserv. In AUMs1/	Total Allow. In AUMs1/	Compet. Reserv. In AUMs1/	Total Allow. In AUMs1/	Total Forage Use In Area4/ In Aums1/
12. White Acorn 46,794	Season Long Grazing	Cattle	06/01-10/15	675	7	782	1,464					
		Sheep	05/01-07/15	1,815	349	500	2,664					
		Sheep	09/01-10/31	1,356			1,356					
		Total		3,846	356	1,282	5,484	217	1,279	None	None	6,763
13. Prospect Mountain 56,623	Season Long Grazing	Cattle	05/01-09/30	1,855	6	340	1,556					
		Cattle	10/01-12/31	385	5	183	275					
		Sheep	05/01-07/15	778	127		2,326					
		Sheep	07/16-08/31	467	80		387					
		Sheep	09/01-12/15	1,089			770					
		Total		4,574	218	523	5,315	396	2,947	None	None	8,262
14. Reservoir 35,545	Season Long Grazing	Sheep	05/01-07/15	702		515	1,217					
		Sheep	07/16-08/31	421	None		421					
		Sheep	09/01-12/15	982			982					
		Total		2,105		515	2,620	74	563	None	None	3,183
15. Poston 50,635	Season Long Grazing	Cattle	05/05-06/30	218		81	299					
		Sheep	05/01-07/15	1,334		440	1,774					
		Sheep	07/16-08/31	133	84		217					
		Sheep	09/01-12/15	2,239			2,239					
		Horses	04/16-12/31	119		16	135					
		Total		4,043	84	537	4,664	124	1,047	None	None	5,711
16. Pine Creek 14,089	Season Long Grazing	Cattle	07/01-10/31	744		103	847					
		Sheep	07/11-09/16	514		26	540					
		Horses	04/16-12/31	77	None	10	87					
		Total		1,335		139	1,474	15	140	None	None	1,614
TOTAL 1,957,604				132,196	1,972	10,233	144,401	5,906	32,916	3,448	9,600	186,917

1/ An AUM is the amount of forage 1 cow, 5 sheep, 14.6 pronghorn, 5 deer, 1.5 elk, 1 moose, or 1 horse would eat in 1 month.

2/ This includes the state and private land AUMs that would be available as exchange of use.

3/ Competitive reservations are the portions of the livestock diets that overlap with those of wildlife and wild horse diets and which are needed to assure proper amounts of forage would be available for the numbers of wild animals expected in each allotment. Total allowance is the sum of these reservations and the additional forage available that wildlife and/or wild horses would use, but livestock would not use. Wild horse allowances represent enough forage for 800 animals for one year (800 X 12 = 9,600 AUMs), or the number of horses that are recommended for the area in the BLM's draft wild horse unit management plans. Wildlife allowances are based on the number of months each species would be expected in each allotment; numbers of animals are estimated from population data provided by the Wyoming Game and Fish Department at the time the AMPs were developed. See TABLE 1-4 for a breakdown of reservations by wildlife species.

4/ Total forage use is the sum of the total livestock use and the total allowances for wildlife and wild horses.

5/ The 10,128 acres of the Buckskin-Sandy and Sandy (I-28) individual use pastures are not included in the Prospect Mountain Allotment for this alternative. See TABLE 8-4. Wildlife competitive AUMs and total allowable AUMs have also been adjusted.

cause of drought conditions or other adverse weather conditions beyond the control of the operator.

The level of use by livestock would be reduced to reflect reservations for wildlife and wild horse use (TABLE 8-2). Wildlife competitive reservations differ from the proposed action for the Steamboat Mountain, Red Desert, Bush Rim, Continental Peak, Pacific Creek, and Sands Allotments in two ways: (1) the allotment boundaries are different, requiring adjustments, and (2) while competitive reservations are based on the class of stock, Alternative 1 proposes a different class of stock from the proposed action. Reservations are also different for the Prospect Mountain Allotment because the Buckskin-Sandy Pasture and the entire I-28 pasture would be retained as individual use pastures and not included in the allotment.

Wild horse competitive reservations are different from the proposed action because the majority of the use for Alternative 1 is sheep, and they are less competitive with horses than cattle (Olsen and Hanson 1977). The total forage provided for wildlife and wild horses within the Sandy area would be the same for this alternative as for the proposed action except for the adjustments made for the Buckskin-Sandy and I-28 individual use pasture (TABLE 8-2).

The Bar X and Fish Creek Allotments, already fenced and operating under existing AMPs, would remain under these plans. The Gold Creek Allotment, including fencing of the Willow Creek Allotment, would remain and the AMP would become fully operational. No new AMPs would be implemented.

Four treatments would be used in various combinations to make up the three different grazing systems proposed for this alternative (TABLE 8-3). The two-pasture and three-pasture deferred systems are described in Chapter 1. Under a season-long grazing system, livestock would enter the allotment at the start of the grazing season as shown on TABLE 8-2 and would graze the total allotment throughout the entire season.

Management of individual use pastures would not change. Class of stock, season of use, and AUMs for individual use pastures are shown in TABLE 8-4.

Livestock use in unfenced allotments would be controlled by herding. Herding of livestock would be the responsibility of the operator. Range supervision for this alternative would involve BLM employees making routine allotment inspections to ensure that livestock numbers and time of grazing for each pasture comply with that proposed for each allotment. Administrative actions related to unauthorized use (trespass) would be taken the same as the proposed action in accordance with BLM Manual 9230.

No range improvements are proposed. Maintenance of existing range improvements would be continued at the present level. TABLE 8-5 shows these improvements by allotment.

ANALYSIS OF ALTERNATIVE 1 IMPACTS

Impacts on the existing environment's resources and land uses that would or could occur as a result of implementation of this alternative are analyzed in two stages: short term (eleven years following completion of this statement) and long term (23 years following completion of this statement). The analysis follows the same general pattern used to analyze the proposed action.

Soils

Sheet Erosion

Under conditions resulting from implementation of this alternative, ground cover would be expected to increase in the Bar X, Fish Creek, and Gold Creek Allotments and to decrease in the Little Colorado Allotment (see vegetation analysis). This would decrease the net estimated sheet erosion rate in the Sandy area by 54,181 tons per year to a total of approximately 8,324,429 tons per year at the end of the 23-year period (TABLE 8-6). Long-term reductions would vary within the proposed allotments depending upon the soil associations present. A detailed analysis of sheet erosion by soil association in each pasture is available for review upon request from the Rock Springs District Office.

The Musgrave Equation was used to compute the changes in sheet erosion rates. These calculations are dependent upon projected long-term increases in litter accumulation and canopy cover (TABLE 8-13) which were used to adjust the ground cover factor in the equation. APPENDIX 2B outlines how these calculations were made.

Mapping Units 132, 233, and 333 would continue to erode at high rates. Large areas (88,630 acres) of these soils are found in the Steamboat Mountain, Bush Rim, Continental Peak, and Pacific Creek Allotments. A pasture level analysis by soil association is available for review upon request from the Rock Springs District Office. No increases in vegetal cover of mapping units with sagebrush-grass vegetation type would be expected in most allotments; therefore, there would be no decreases in sheet erosion rates.

Mapping Units 221, 222, 223, 225, and 320 in the Bar X, Fish Creek, and Gold Creek Allotments cover more than 49% (18,029 acres) of these areas and would be expected to have large increases in ground cover. No change in present erosion rates would be expected in the saline and alkaline soils, forested soils, meadow soils, mountain shrub soils, and stable sand dune soils for the same reason.

Sheet erosion rates would be expected to increase in the Little Colorado Allotment due to anticipated decreases in ground cover (TABLE 8-13). All mapping

TABLE 8-3

PROPOSED GRAZING SYSTEMS UNDER ALTERNATIVE 1

System	Number of Allotments	Acres
Two-Pasture Deferred Grazing	1	7,237
Three-Pasture Deferred Grazing	2*	31,475
Season-Long Grazing	15**	1,918,892
TOTALS	18	1,957,604

* The Gold Creek Allotment is divided into two allotments: the Gold Creek portion utilizing a three-pasture deferred system and the Willow Creek portion utilizing season-long grazing.

** The Little Sandy - Little Prospect Allotment is divided into two allotments: the Little Sandy and the Little Prospect; both utilize season-long grazing.

TABLE 8-4

PROPOSED USE OF NRL IN INDIVIDUAL USE PASTURES UNDER ALTERNATIVE 1

Area	Acres of NRL	AUMs From NRL	Class of Stock	Season of Use
I-1	170	6	Cattle	03/01 to 02/28
I-2	77	5	Cattle	05/01 to 12/15
I-3	144	16	Cattle	05/01 to 12/15
I-4	54	11	Cattle	05/01 to 12/15
I-5	297	20	Sheep	05/01 to 10/31
I-6	503	61	Horses	05/01 to 12/15
I-7	265	29	Horses	05/01 to 12/15
I-8	13	1	Cattle & Sheep	05/01 to 12/15
I-9	96	8	Cattle	06/01 to 10/31
I-10	71	6	Cattle	06/01 to 10/31
I-11	178	11	Cattle	05/15 to 09/15
I-12	66	9	Cattle & Sheep	05/03 to 10/31
I-13	13	5	Cattle & Sheep	05/03 to 10/31
I-14	16	2	Sheep	05/01 to 10/31
I-15	2,209	286	Sheep	05/01 to 10/31
I-16	96	23	Sheep	05/01 to 10/31
I-17	197	14	Cattle	10/01 to 10/31
I-18	120	11	Cattle	05/01 to 10/31
I-19	191	17	Horses	05/05 to 09/30
I-20	3	1	Cattle	05/01 to 10/31
I-21	1,094	125	Cattle	08/15 to 09/15
I-22	19	4	Cattle	07/01 to 10/31
I-23	92	6	Cattle	07/01 to 10/31
I-24	1,197	83	Cattle & Sheep	05/05 to 12/31
I-25 Long Draw Pasture	2,153	270	Cattle	07/01 to 09/30
I-26 Grass Creek Pasture	1,677	208	Cattle	07/01 to 10/31
I-27	98	5	Cattle	05/01 to 09/30
I-28 Sandy Pasture	1,389	180	Cattle	05/01 to 12/31
I-29	13	1	Cattle	05/01 to 10/31
I-30 Buckskin Pasture	1,083	41	Cattle	07/01 to 09/30
I-31	537	75	Cattle	05/01 to 01/30
I-32	85	6	Cattle	05/01 to 01/31
I-33	8	1	Cattle	10/01 to 10/31
Buckskin-Sandy Pasture	7,365	742	Cattle	06/16 to 10/31
TOTAL	21,589*	2,289		

* This represents only the national resource lands in the individual use pastures. The pastures total 39,726 acres.

TABLE 8-5

WATER DEVELOPMENTS AND FENCES (ALTERNATIVE 1)[1/]

Allotment	Springs[2/]	Wells	Reservoirs	Windmills	Fence (Miles)
Bar X	0	0	0	0	11
Fish Creek	0	0	3	0	11
Gold Creek	8	2	0	0	19
Little Sandy- Little Prospect	13	8	46	0	0
Steamboat Mountain	13	2	11	0	0
Little Colorado:					
Green River Use Area	1	23	4	0	0
Farson Use Area	3	17	11	0	0
Big Sandy Use Area	0	23	8	0	0
Red Desert	3	11	6	1	0
Bush Rim	17	5	34	0	0
Continental Peak	7	2	14	0	0
Pacific Creek	23	9	102	0	0
Sands	9	5	5	0	0
White Acorn	3	0	11	0	0
Prospect Mountain	11	4	21	0	0
Reservoir	0	0	5	0	0
Poston	1	0	18	0	0
Pine Creek	1	0	0	0	0
TOTALS	113	111	299	1	41

1/ Includes unfenced private and state waters; does not include fencing in individual use pastures.

2/ Includes developed springs.

TABLE 8-6

LONG-TERM SHEET EROSION UNDER ALTERNATIVE 1

Allotment Pasture	Acres	Geologic Erosion Tons/Year	Sheet Erosion Tons/Year	Total Erosion Tons/Year
Bar X				
1	2,124	1,950	1,273	3,223
2	2,543	2,335	740	3,075
3	2,228	2,045	396	2,441
Total	6,895	6,330	2,409	8,739
Fish Creek				
1	3,389	3,111	2,467	5,578
2	3,848	3,532	3,048	6,580
Total	7,237	6,643	5,515	12,158
Gold Creek				
1	4,662	4,280	3,505	7,785
2	10,591	9,723	9,235	18,958
3	9,327	8,562	6,806	15,368
Total	24,580	22,565	19,546	42,111
Willow Creek	5,945	5,458	9,293	14,751
Little Sandy	114,879	105,459	315,047	420,506
Little Prospect	70,781	64,977	160,476	225,453
Steamboat Mountain	38,276	35,137	625,880	661,017
Little Colorado	726,956	667,346	1,768,487	2,435,833
Red Desert	252,229	231,546	467,829	699,375
Bush Rim	100,437	92,201	756,188	848,389
Continental Peak	89,914	82,541	569,231	651,772
Pacific Creek	203,738	187,031	895,825	1,082,856
Sands	112,051	102,863	407,962	510,825
White Acorn	46,794	42,957	134,619	177,576
Prospect Mountain	56,623	51,980	146,632	198,612
Reservoir	35,545	32,630	72,108	104,738
Poston	50,635	46,483	151,527	198,010
Pine Creek	14,089	12,934	18,774	31,708
TOTALS	1,957,604	1,797,081	6,527,348	8,324,429

units, with the exception of 110 which is located in flat terrain, would be affected and erosion rate increases would occur in more than 99% (723,908 acres) of the allotment. Exact amounts of increase by mapping unit are available for review upon request from the Rock Springs District Office.

The guidelines for acceptable average erosion per pasture (Soil Conservation Service 1973) were used to determine the acres by class under this alternative. It was found that 432,365 acres would be in the excessive erosion category of more than 5 tons per acre per year (TABLE 8-7). This represents an increase of 12,731 acres in this category over the existing conditions (TABLE 2-4). The moderate average erosion per pasture would occur on 1,486,527 acres, an increase of 68,762 acres. The increase in acres under excessive and moderate sheet erosion would be reflected in a decrease in the light category from 91,621 to 38,712 acres (TABLE 8-7).

Wind Erosion

Wind erosion rates respond inversely to the ground cover (Humphrey 1962). Since the ground cover would generally be expected to decrease area-wide (vegetation analysis, TABLE 8-13), the amount of wind erosion would be expected to increase. The amount is not quantifiable at this time because studies are not available.

Compaction

Determined by using a technique similar to that used to estimate the relative degree of current use by livestock (APPENDIX 2D), TABLE 8-8 portrays the expected relative degree of use for the short and long terms.

Increased acres in the light, moderate, heavy, and severe classes and the corresponding decrease in slight to marginal class during the short term reflect the activation of nonuse in this alternative (refer to TABLE 2-6 for comparison with TABLE 8-8). In most allotments the acreage in the heavy and severe use areas would be estimated to increase as a result of increased livestock use. This area of 75,216 acres would be increasingly compacted over the short term, resulting in reduced infiltration rates and increased runoff and erosion.

Livestock grazing intensity would increase over the long term in the Bar X, Fish Creek, Gold Creek, and Willow Creek Allotments because of anticipated increases in AUMs used by livestock (TABLE 2-24 and 8-14). Grazing intensity in the Little Sandy, Steamboat Mountain, Little Colorado, Red Desert, Continental Peak, Pacific Creek, Reservoir, and Pine Creek Allotments would decrease. Grazing intensity would remain unchanged in the Little Prospect, Bush Rim, Sands, White Acorn, Prospect Mountain, and Poston Allotments. There would be a total decrease in livestock use of 18,162 AUMs for the Sandy area (TABLES 2-24 and 8-14), which would result in a corresponding long-term decrease in grazing intensity (TABLE 8-8). Acres in the heavy and severe intensity classes would be reduced by 13,238 acres over the long term due to a decrease in livestock use of those areas where soil compaction would be expected to occur.

Water Resources

Water Use

Water consumption by livestock under this alternative would be 134 acre-feet per year at the end of the eleven years and 117 acre-feet per year at the end of Year 23 (TABLE 8-9). This would be an increase of 62 acre-feet in the short term and 45 acre-feet in the long term above existing water use levels (TABLE 2-7).

The increase in consumptive use by livestock in the short term is due to an increase in active AUMs over the present active use (TABLE 1-1). The decrease in the long term would be due to a decrease in production of AUMs (TABLES 2-24 and 8-14) and corresponding reduction in livestock numbers.

Streamflow

Changes in runoff from Alternative 1 would have no measurable effect on annual perennial streamflow (see Chapter 3 discussion). However, storm runoff from a ten-year event would increase 5% above existing levels in the Sandy area at the end of 23 years and 3% at the end of eleven years (TABLE 8-10). This increase would be due to decreased infiltration rates under season long grazing and a projected long-term decrease in vegetation cover on the Little Colorado Allotment (see vegetation analysis section).

Storm runoff values were calculated on model basins within the Sandy area. Input to these models were allotment mean infiltration rates by vegetation types (APPENDIX 3A), allotment mean vegetative conditions, and allotment acres by intensity of use class (TABLE 8-2). Runoff values reflect storm runoff from the model basins if the mean allotment conditions existed within the model basin. It was not feasible to calculate runoff for each allotment. Relative changes based on model watersheds are listed in TABLE 8-10.

Ten-year storm runoff from the Bar X, Fish Creek, Gold Creek, and Steamboat Mountain Allotments would decrease below existing levels (TABLE 8-10) due to the decrease in acres in the severe, heavy, moderate, and light grazing intensity classes (TABLE 8-8).

Water Quality

This alternative would have no measurable effect on water quality in perennial streams within the Sandy area or downstream. As perennial streamflow would not be expected to change, sediment transport would remain unchanged in perennial streams (see Chapter 3 streamflow discussion).

Sediment yield in the intermittent streams in the Sandy area increases proportionally to the increase in storm runoff (TABLE 8-10). However, sediment transport

TABLE 8-7

ACREAGES OF EROSION BY CLASS UNDER ALTERNATIVE 1

Allotment	Light*	Moderate*	Excessive*
Bar X	6,895		
Fish Creek	7,237		
Gold Creek	24,580		
Willow Creek		5,945	
Little Sandy		114,879	
Little Prospect		70,781	
Steamboat Mountain			38,276
Little Colorado		726,956	
Red Desert		252,229	
Bush Rim			100,437
Continental Peak			89,914
Pacific Creek			203,738
Sands		112,051	
White Acorn		46,794	
Prospect Mountain		56,623	
Reservoir		35,545	
Poston		50,635	
Pine Creek		14,089	
TOTAL	38,712	1,486,527	432,365

*Light - less than 2 tons per acre per year; Moderate - 2 to 5 tons per acre per year; Excessive - greater than 5 tons per acre per year.

TABLE 8-8

PROJECTED SHORT-TERM AND LONG-TERM ACRES OF GRAZING INTENSITY UNDER ALTERNATIVE 1

Allotment	Short-Term Mean: Marginal* to Slight*	Short-Term Mean: Light*	Short-Term Mean: Moderate*	Short-Term Mean: Heavy*	Short-Term Mean: Severe*	Long-Term Mean: Marginal* to Slight*	Long-Term Mean: Light*	Long-Term Mean: Moderate*	Long-Term Mean: Heavy*	Long-Term Mean: Severe*
Bar X	415	4,891	1,125	319	145	415	4,683	1,265	364	168
Pasture 1	0	1,595	380	104	45	0	1,521	433	119	51
Pasture 2	0	2,025	364	105	49	0	1,957	412	119	55
Pasture 3	415	1,271	381	110	51	415	1,205	420	126	62
Fish Creek	0	5,637	1,142	318	140	0	5,405	1,307	364	161
Pasture 1	0	2,580	577	161	71	0	2,463	660	184	82
Pasture 2	0	3,057	565	157	69	0	2,942	647	180	79
Gold Creek	0	19,293	3,933	980	374	0	18,607	4,422	1,118	433
Pasture 1	0	2,643	1,481	384	154	0	2,393	1,664	432	173
Pasture 2	0	9,048	1,167	277	99	0	8,843	1,322	314	112
Pasture 3	0	7,602	1,285	319	121	0	7,371	1,436	372	148
Willow Creek	0	4,575	1,005	261	104	0	4,402	1,131	294	118
Little Sandy	17,523	81,062	11,682	3,217	1,395	25,318	76,039	9,862	2,599	1,061
Little Prospect	24,059	36,207	7,703	2,006	806	24,058	36,208	7,703	2,006	806
Steamboat Mountain	19,376	15,239	2,791	647	223	22,175	14,087	1,535	356	123
Little Colorado	429,874	202,277	66,910	19,141	8,754	429,873	221,743	54,091	14,843	6,406
Red Desert	187,536	24,273	28,201	8,285	3,934	187,536	34,654	21,313	6,021	2,705
Bush Rim	41,249	51,044	6,077	1,503	564	41,250	51,043	6,077	1,503	564
Continental Peak	40,107	35,386	10,437	2,806	1,178	40,106	37,610	8,970	2,312	916
Pacific Creek	44,611	135,282	17,424	4,568	1,853	72,474	111,595	14,373	3,768	1,528
Sands	70,901	32,941	6,161	1,498	550	70,901	32,941	6,161	1,498	550
White Acorn	11,174	25,282	7,385	2,052	901	11,174	25,282	7,385	2,052	901
Prospect Mountain	2,260	45,469	6,650	1,675	659	2,263	45,469	6,650	1,675	656
Reservoir	7,386	23,661	3,232	885	381	12,969	18,970	2,591	710	305
Poston	9,349	32,899	5,990	1,665	732	9,350	32,898	5,990	1,665	732
Pine Creek	430	11,085	1,877	495	202	431	11,084	1,877	495	202
TOTAL**	960,250	786,503	189,635	52,321	22,895	950,293	782,720	162,613	43,643	18,335

*Marginal - Those acres generally too distant from water to be grazed.
Slight - Those acres within reach of water, but grazed at an intensity greater than 75 acres/AUM.
Light - Grazing intensity from 16 to 75 acres/AUMs.
Moderate - Grazing intensity from 5.5 to 16 acres/AUM.
Heavy - Grazing intensity from 2 to 5.5 acres/AUM.
Severe - Grazing intensity less than 2 acres/AUM.

**Totals by class will not total to exact acreages in allotments due to rounding inherent in the method of calculation.

TABLE 8-9

WATER USE BY LIVESTOCK, INCLUDING EXCHANGE OF USE,
UNDER ALTERNATIVE 1

Allotment	Short Term in Acre-Feet*	Long Term in-Acre Feet*
Bar X	0.79	0.88
Fish Creek	0.82	0.91
Gold Creek	2.81	3.10
Willow Creek	0.70	0.77
Little Sandy	8.60	7.45
Little Prospect	5.37	5.39
Steamboat Mountain	2.18	1.40
Little Colorado	45.53	37.37
Red Desert	18.09	13.74
Bush Rim	4.93	4.94
Continental Peak	7.06	6.17
Pacific Creek	13.21	11.32
Sands	4.54	4.55
White Acorn	4.48	5.05
Prospect Mountain	4.33	4.89
Reservoir	2.41	2.00
Poston	4.28	3.94
Pine Creek	1.35	1.36
Allotment Total	131.48	115.23
Individual Use Pastures**	2.11	2.11
TOTAL	133.59	117.34

* Based on use of 300 gallons per AUM
** From national resource land AUMs (TABLE 8-4).

TABLE 8-10

MODEL STORM RUNOFF IN ACRE-FEET BY ALLOTMENT
UNDER ALTERNATIVE 1
(10-YEAR STORM)

Allotment	Existing	Short Term	Long Term
1. Bar X	1.5	1.5	0.5
2. Fish Creek	0.9	0.8	0.3
3. Gold Creek	19.8	20.2	17.1
3a. Willow Creek	2.8	2.9	2.9
4. Little Sandy	64.3	65.7	65.6
4a. Little Prospect	13.9	14.0	14.0
5. Steamboat Mountain	120.8	30.2	30.2
6. Little Colorado	14.7	15.1	17.2
7. Red Desert	17.1	17.4	17.4
8. Bush Rim	66.9	68.1	68.1
9. Continental Peak	82.9	84.1	84.0
10. Pacific Creek	58.2	62.3	62.3
11. Sands	2.0	35.5	35.5
12. White Acorn	12.8	12.9	12.9
13. Prospect Mountain	11.4	11.9	11.9
14. Reservoir	22.1	22.6	22.6
15. Poston	15.5	16.1	16.1
16. Pine Creek	2.2	2.2	2.2
Weighted Mean	29.5	30.4	31.1
Percent Change		+3%	+5%

would decrease on the Bar X, Fish Creek, Gold Creek, and Steamboat Mountain Allotments in 23 years due to a decrease in runoff in these allotments (TABLE 8-10). Sediment yield increases proportionally to discharge (FIGURE 2-10). The Pacific Southwest Interagency Committee (PSIAC) method (APPENDIX 2F) was applied to Alternative 1, and these calculations indicate there would be a 7% increase in sediment yield. Total sediment yield would be 2,103,484 tons per year. This would not significantly change water quality in perennial streams since streamflow would not be expected to change; subsequently, sediment transportation would be unchanged.

Channel stability would decrease in the Sandy area due to increased grazing intensity along streams (TABLE 8-11). Channel stability is a measure of the erodibility of bed and bank sediment, an indicator of bank erosion. Channel stability was evaluated by determining the relative grazing intensity of livestock, the length of rest of each pasture, and the channel stability improvement potential (APPENDIX 3B).

Channel stability would increase, decreasing bank erosion in the Bar X and Gold Creek Allotments (TABLE 8-11). This is due to a decrease in livestock grazing intensity along streams during the grazing period (TABLE 8-12). The channel stability in the other allotments would remain at about the same level. The concentration of dissolved solids would increase during runoff events in the intermittent streams within the Sandy area because of an increase in upland sediments from intermittent streams.

Sediment has been identified as a major factor in salinity levels (Chapter 3 water resources). Salinity levels would decrease on the Bar X, Gold Creek, Prospect Mountain, and Reservoir Allotments due to a projected decrease in sediment yield and runoff.

Fecal coliforms (indicators of bacteriological contamination) from livestock grazing on NRL would increase above existing levels because of increased grazing intensity (TABLE 8-12). Kunkle (1970) found "that only the area immediately adjacent to the stream, rather than the entire watershed, is of major importance in terms of introducing this sort of pollution into the stream"

Fecal coliforms from livestock grazing on NRL would decrease on the Bar X, Gold Creek, Prospect Mountain, and Reservoir Allotments due to a decrease in grazing intensity (TABLE 8-12). Grazing intensity is functionally related to sources of fecal coliforms (feces). A change in fecal coliforms from livestock grazing on NRL may not affect the concentration in perennial streams due to additional sources such as wildlife, man, and livestock grazing on private and state lands. However, no information is available to estimate the effects of livestock grazing on the existing concentration of fecal coliforms for national resource lands.

Vegetation

This alternative involves two- and three-pasture deferred grazing systems on the Bar X, Fish Creek, and Gold Creek Allotments totaling 38,712 acres (TABLE 8-2). Season-long grazing would occur on the remaining fifteen allotments, containing a total of 1,918,892 acres.

Vegetation Types

The overall type acreages for the Sandy area as shown in TABLES 2-13 and 2-14 would not be expected to change significantly under this alternative. Plant composition within each type that is grazed continuously throughout the growing season would be expected, however, to change slightly to more of a shrub-forb complex where cattle grazing would be continued at intensive levels in the Little Sandy, Little Prospect, Little Colorado, Prospect Mountain, and Pine Creek Allotments. Hormay (1970) states that a major cause of range deterioration is selective, close grazing of plants and range areas in similar yearly patterns of use.

Season-Long Grazing. The degree of change in plant composition would depend on the intensity of use and class of stock utilizing the area. The vigor of the desirable forage plants selectively grazed continuously throughout the growing season would be reduced and eventually would be replaced by the undesirable forage plants which are not being grazed and by the rhizomatous species. Rhizomatous species provide vegetal cover even under continuous, yearlong grazing (Texas Tech University 1976).

Vegetal and ground cover within each vegetation type would not be expected to change in the long term except in the Little Colorado Allotment (TABLE 8-13), and this would primarily be a decrease in percent ground cover. The change in the Little Colorado would be the result of the lack of water. This limits the areas grazed by cattle and would cause continuous grazing of all forage species—desirable and undesirable—around the existing waters. Vegetation in the vicinity of the waters would be destroyed by overgrazing and trampling from the heavy concentration of livestock, wildlife, and wild horses. Trailing to and from waters would also destroy vegetation if the same trails are used time after time.

Forage Production. Total forage production should decrease slightly over the long term as a result of a 5% decrease in the Gold Creek, Steamboat Mountain, Little Colorado, Red Desert, Bush Rim and Sands Allotments. TABLE 8-14 shows the long-term production by allotment. Production will go down in those allotments because of continuous livestock grazing during the critical growing period of the forage species.

Range Condition and Trend. Those areas presently on a downward trend (MAPS 2-11 and 2-12) would continue on the same trend under this alternative. The condition of range would continue to deteriorate in these areas if present livestock management were to continue. The primary reason for the change in condition would be the change in composition from desirable to undesirable species. The desirable species would be continuously grazed and could not maintain sufficient leaf material to produce and store food necessary for plant growth. This would not allow them to maintain vigor, produce seed, establish new plants, or maintain their percent composition in the type. The less desirable and undesirable species would be

TABLE 8-11

PROJECTED CHANNEL STABILITY RATING

UNDER ALTERNATIVE 1*

Allotment	Stream Miles	Present	Potential	23 Years Future
Bar X	9.00	99	79	92
Fish Creek	5.50	92	84	87
Gold Creek	29.75	96	90	93
Willow Creek	9.25	98	93	112
Little Sandy	35.00	110	90	123
Little Prospect	7.25	95	77	108
Steamboat Mountain	9.50	110	89	116
Little Colorado	60.25	94	86	103
Continental Peak	6.25	99	79	113
Pacific Creek	48.00	107	92	114
White Acorn	22.75	96	81	109
Prospect Mountain	24.75	103	98	114
Reservoir	14.50	111	111	122
Poston	3.00	104	104	113
Pine Creek	10.50	97	92	110
TOTAL MILES	295.25			
MEAN		100	90	109
Percent Change			-10%	+9%

*Channel Stability Rating	Condition
38 or less	Excellent
39-76	Good
77-95	High-Fair
96-114	Low-Fair
115 or more	Poor

TABLE 8-12

RELATIVE GRAZING INTENSITY 100 YARDS FROM WATER
UNDER ALTERNATIVE 1*

Allotment	Existing	Short Term
Bar X	92	80
Fish Creek	65	74
Gold Creek	44	37
Willow Creek	44	59
Little Sandy	59	63
Little Prospect	59	59
Steamboat Mountain	7	18
Little Colorado	60	83
Red Desert	3	97
Bush Rim	1	24
Continental Peak	35	68
Pacific Creek	10	47
Sands	15	34
White Acorn	45	68
Prospect Mountain	42	39
Reservoir	67	64
Poston	49	72
Pine Creek	35	57
Weighted Mean	38	68
Percent Change		+79%

* A relative intensity of 1 is the lowest intensity in the Sandy area, and a relative intensity of 100 is the highest. (See APPENDIX 2B for detailed discussion.)

TABLE 8-13

AVERAGE PERCENT GROUND COVER AND VEGETAL COVER
UNDER ALTERNATIVE 1

Allotments	Vegetation Types: Sagebrush Grass % Ground Cover	Sagebrush Grass % Vegetal Cover	Saltbush-Winterfat % Ground Cover	Saltbush-Winterfat % Vegetal Cover	Greasewood % Ground Cover	Greasewood % Vegetal Cover	Meadow % Ground Cover	Meadow % Vegetal Cover	Grass % Ground Cover	Grass % Vegetal Cover	Perennial Forbs % Ground Cover	Perennial Forbs % Vegetal Cover	Mountain Shrub % Ground Cover	Mountain Shrub % Vegetal Cover	Conifer % Ground Cover	Conifer % Vegetal Cover
Bar X	60	17					94	30								
Fish Creek	46	15					91	26								
Gold Creek	40	17					73	25					95	18	78	9
Willow Creek	33	17					73	25					95	15	78	9
Little Sandy	39	15					86						77	12		
Little Prospect	39	15					86	30					77	12		
Steamboat Mountain	49	11			56	12	60	22			16	6	79	18		
Little Colorado	23	17	21	15	28	11	31	30	24	23					27	12
Red Desert	27	14	27	9	22	6			18	15	16	9				
Bush Rim	28	13	42	11	14	16	97	18	18	15	16	12	64	19	78	9
Continental Peak	47	16	16	7	74	11	97	19	18	14	22	14	94	19		
Pacific Creek	40	14	68	6	22	21	82		47	12	11	12	94	16	76	11
Sands	29	15			14	12	65	23	32	16	11	12			74	8
White Acorn	54	16					77	29					53	14	78	11
Prospect Mountain	36	15					56	30					77	16	93	3
Reservoir	32	12					49	28								
Poston	28	13					51	30								
Pine Creek	56	15					60	26								
TOTAL AVERAGES	39	15	35	10	33	13	72	26	26	16	15	11	81	16	73	9

TABLE 8-14

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 1 BY ANIMAL CLASS
IN AUMS AND POUNDS OF DRY WEIGHT FORAGE

	Cattle and Domestic Horses		Sheep		Wild Horses	
Allotment	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
1. Bar X	847,080 (1,086)	686,400 (880)	933,750 (1,245)	57,000 (76)	0 (0)	0 (0)
2. Fish Creek	818,220 (1,049)	769,860 (987)	849,000 (1,132)	0 (0)	0 (0)	0 (0)
3. Gold Creek	2,825,160 (3,622)	2,626,260 (3,367)	2,579,250 (3,439)	0 (0)	0 (0)	0 (0)
3a. Willow Creek	614,640 (788)	652,080 (836)	563,250 (751)	0 (0)	0 (0)	0 (0)
4. Little Sandy	6,786,000 (8,700)	6,101,940 (7,823)	7,810,500 (10,414)	201,750 (269)	0 (0)	0 (0)
4a. Little Prospect	4,555,980 (5,841)	1,921,920 (2,464)	5,206,500 (6,942)	2,541,000 (3,388)	0 (0)	0 (0)
5. Steamboat Mountain	1,404,000 (1,800)	329,940 (423)	1,509,000 (2,012)	824,250 (1,099)	0 (0)	0 (0)
6. Little Colorado	29,835,780 (38,251)	5,709,600 (7,320)	31,318,500 (41,758)	24,954,750 (33,273)	34,425,900 (38,251)	1,620,000 (1,800)
7. Red Desert	9,539,400 (12,230)	0 (0)	12,907,500 (17,210)	11,194,500 (14,926)	11,007,000 (12,230)	4,749,300 (5,277)
8. Bush Rim	4,707,300 (6,035)	0 (0)	5,292,000 (7,056)	4,025,250 (5,367)	5,431,500 (6,035)	1,206,000 (1,340)
9. Continental Peak	4,978,740 (6,383)	0 (0)	5,466,750 (7,289)	5,025,000 (6,700)	5,744,700 (6,383)	1,064,700 (1,183)
10. Pacific Creek	8,276,580 (10,611)	494,520 (634)	10,014,000 (13,352)	8,748,750 (11,665)	0 (0)	0 (0)
11. Sands	4,172,220 (5,349)	1,977,300 (2,535)	4,671,000 (6,228)	1,805,250 (2,407)	0 (0)	0 (0)
12. White Acorn	4,195,620 (5,379)	706,680 (906)	4,087,500 (5,450)	3,433,500 (4,578)	0 (0)	0 (0)
13. Prospect Mountain	4,188,600 (5,370)	1,955,460 (2,507)	4,515,750 (6,021)	2,106,000 (2,808)	0 (0)	0 (0)
14. Reservoir	1,274,520 (1,634)	0 (0)	1,683,750 (2,245)	1,631,250 (2,175)	0 (0)	0 (0)
15. Poston	2,693,340 (3,453)	297,960 (382)	3,415,500 (4,554)	3,211,500 (4,282)	0 (0)	0 (0)
16. Pine Creek	943,020 (1,209)	706,680 (906)	1,179,750 (1,573)	426,000 (568)	0 (0)	0 (0)
TOTALS	92,656,200 (118,790)	24,936,600 (31,970)	104,003,250 (138,671)	70,185,750 (93,581)	56,609,100 (62,899)	8,640,000 (9,600)

TABLE 8-14 (Cont'd)

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 1 BY ANIMAL CLASS
IN AUMS AND POUNDS OF DRY WEIGHT FORAGE

	Antelope		Deer		Elk		Moose	
Allotment	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
1. **Bar X**	561,782 (697)	29,822 (37)	626,430 (1,330)	75,360 (160)	0 (0)	0 (0)	0 (0)	0 (0)
2. **Fish Creek**	807,612 (1,002)	36,270 (45)	1,047,504 (2,224)	75,360 (160)	0 (0)	0 (0)	359,100 (665)	19,440 (36)
3. **Gold Creek**	1,848,964 (2,294)	120,900 (150)	2,177,904 (4,624)	399,879 (849)	2,266,380 (4,197)	317,520 (588)	631,260 (1,169)	37,800 (70)
3a. **Willow Creek**	405,418 (503)	33,046 (41)	472,884 (1,004)	95,142 (202)	527,580 (977)	129,600 (240)	136,620 (253)	14,040 (26)
4. **Little Sandy**	9,040,902 (11,217)	490,854 (609)	9,215,115 (19,565)	1,988,091 (4,221)	1,976,940 (3,661)	967,140 (1,791)	779,220 (1,443)	122,580 (227)
4a. **Little Prospect**	6,027,268 (7,478)	301,444 (374)	6,143,724 (13,044)	1,211,883 (2,573)	1,317,600 (2,440)	1,007,100 (1,865)	519,480 (962)	104,220 (193)
5. **Steamboat Mountain**	1,744,812 (2,202)	124,124 • (154)	1,764,366 (3,746)	72,534 (154)	1,876,500 (3,475)	77,760 (144)	0 (0)	0 (0)
6. **Little Colorado**	45,854,146 (56,891	2,414,776 (2,996)	6,581,283 (13,973)	168,618 (358)	1,189,080 (2,202)	0 (0)	0 (0)	0 (0)
7. **Red Desert**	13,311,090 (16,515)	519,870 (645)	4,902,168 (10,408)	424,842 (902)	1,520,640 (2,816)	99,360 (184)	0 (0)	0 (0)
8. **Bush Rim**	6,055,478 (7,513)	336,102 (417)	3,180,663 (6,753)	176,154 (374)	4,962,060 (9,198)	172,800 (320)	0 (0)	0 (0)
9. **Continental Peak**	5,528,354 (6,859)	270,010 (335)	4,635,111 (9,841)	538,353 (1,143)	3,104,460 (5,749)	108,000 (200)	0 (0)	0 (0)
10. **Pacific Creek**	7,783,542 (9,657)	761,670 (945)	8,338,584 (17,704)	313,215 (665)	4,728,780 (8,757)	457,920 (848)	72,900 (135)	53,460 (99)
11. **Sands**	5,285,748 (6,558)	310,310 (385)	6,337,305 (13,455)	188,871 (401)	5,663,520 (10,488)	228,960 (424)	0 (0)	0 (0)
12. **White Acorn**	2,893,540 (3,590)	188,604 (234)	3,141,099 (6,669)	756,426 (1,606)	1,695,060 (3,139)	466,560 (864)	966,060 (1,789)	51,840 (96)
13. **Prospect Mountain**	4,569,214 (5,669)	268,398 (333)	4,752,390 (10,090)	755,955 (1,605)	1,015,740 (1,881)	535,680 (992)	234,360 (434)	58,320 (108)
14. **Reservoir**	1,810,276 (2,246)	146,692 (182)	1,823,712 (3,872)	349,482 (742)	0 (0)	0 (0)	54,000 (100)	25,920 (48)
15. **Poston**	3,487,562 (4,327)	146,692 (182)	2,995,560 (6,360)	29,202 (62)	0 (0)	0 (0)	32,400 (60)	19,440 (36)
16. **Pine Creek**	673,816 (836)	42,718 (53)	657,987 (1,397)	113,511 (241)	187,380 (347)	0 (0)	242,460 (449)	19,440 (36)
TOTALS	117,719,524 (146,054)	6,542,302 (8,117)	68,793,789 (146,059)	7,732,878 (16,418)	32,031,720 (59,327)	4,568,400 (3,460)	4,027,860 (7,459)	526,500 (975)

able to maintain their abundance, produce seed, and gradually replace the more desirable species. Vegetation condition acres should be the same as those described in Chapter 2 future environment (TABLE 2-77).

Deferred Grazing Systems. The grazing systems proposed for the Bar X, Fish Creek, and Gold Creek Allotments would afford a deferment from grazing until seedripe in the two-pasture system of Fish Creek and the three-pasture system of Gold Creek and until flowering and seedripe dates in the three-pasture system of Bar X. This would allow the plants to maintain their vigor and produce seed. Plant composition would not be expected to change as adequate rest would be provided to maintain the present situation, but no rest is allowed for seedling establishment. Ground cover should improve as reflected in TABLE 8-13. This would be the result of increased vigor on plants and reduced utilization, leaving increased amounts of litter at the end of the grazing season. Johnson (1965) found that deferred grazing resulted in reduced utilization without reducing the number of animals grazed.

Forage production would increase over the long term on those three allotments under deferred grazing systems. The predicted increase would mostly be a result of the increased vigor in the meadow type, which is currently taking the bulk of the grazing load.

Range trend and condition should improve on the three allotments with deferred grazing. This would be a result of the improved vigor on the desirable species.

Threatened or Endangered Plants

As discussed in Chapter 2, *Lesquerella macrocarpa and Antennaria arcuata* may occur within the Sandy area. Their response to the proposed grazing treatments for this alternative should be similar to other species of similar growth characteristics. Their existence should continue if they are present in the Sandy area.

Vegetation Production

The data and methods for determining vegetation production as explained in Chapter 2 were utilized along with professional judgment as to the potential of the Sandy area to determine long-term production figures by animal class of each allotment. These figures are reflected on TABLE 8-15.

Wildlife

Terrestrial

Impacts from this alternative would affect the populations of the four major wildlife species in the Sandy area (pronghorn antelope, mule deer, elk, and moose) as well as sage grouse, waterfowl, and numerous nongame species. The primary factors relative to the impacts on wildlife populations to be considered are food, water, cover, space, and migration habits and the conditions and availability of each factor. Projected populations are based on a summarized qualitative analysis of various elements outlined in the description of the alternative. A detailed analysis by critical element is available upon request from the Rock Springs District Office.

Pronghorn Antelope. The implementation of Alternative 1 would reduce antelope populations to between 9,500 and 6,800 animals, with the population level averaging about 8,750. The Wyoming Game and Fish Department desired level is 9,900.

Food. As stated in Chapter 2, the sagebrush-grass vegetation type is the most common to antelope habitat and sagebrush is the forage species most heavily used by antelope on a yearlong basis (Taylor 1975). This vegetation type would not be expected to change in size as a result of implementation of this alternative.

Forage reservations consistent with Wyoming Game and Fish Department estimates have been made on each allotment with a resulting reduction in livestock numbers to accommodate these pronghorn numbers. Forage production on the total Sandy area for pronghorn would be expected to remain approximately the same as for the present situation (TABLES 2-27 and 8-15) over the long term. Analysis of forage availability from these tables on the crucial winter habitat indicates that forage requirements for the wintering populations within each allotment where this habitat occurs (MAP 2-11) would be adequately satisfied.

Cover. Based on the analysis of food adequacy for pronghorn on the Sandy area and projected size of the sagebrush-grass vegetation type, cover requirements should not be affected to any extent. The problems with the sheep-tight highway fences as discussed in Chapter 2 would continue.

Water. With the class of livestock and their use levels remaining at approximately present levels on antelope summer habitat, no change in availability of water would be expected.

Space. This factor relates to the ability of a given animal to move throughout its habitat with a certain degree of ease. Movement within the Sandy area would not be expected to change significantly, thus giving relatively unrestricted mobility. No change in availability of space would occur within the Sandy area from implementation of this alternative.

Migration. Present migration patterns would not be expected to be altered from this alternative since additional fencing and water developments would not be constructed.

Mule Deer. Under present management of livestock in the Sandy area, a population of approximately 7,400 deer is considered normal and is the desired level according to the Wyoming Game and Fish Department. The implementation of Alternative 1 would not significantly affect the mule deer population, and it would be expected to stabilize at the current level of approximately 5,200.

Food. The sagebrush-grass and mountain shrub vegetation types are the primary habitat types common to the deer populations within the Sandy area. The shrubs found in these types are the primary forage plants uti-

TABLE 8-15

PREDICTED LONG-TERM FORAGE PRODUCTION FOR MAJOR ANIMAL SPECIES IN THE SANDY AREA AFTER IMPLEMENTATION OF ALTERNATIVE 1

Species	AUMs*	Animal Months Provided*	Pounds Available Dry Weight Forage
Cattle	118,790	118,790	92,656,200
Sheep	138,671	693,355	104,003,250
Wild Horses	62,899	62,899	56,609,100
Pronghorn Antelope	146,054	2,132,388	117,719,524
Mule Deer	146,059	730,295	68,793,789
Elk	59,327	88,991	32,031,720
Moose	7,459	7,459	4,027,860

*These figures represent the total proper use grazing capacity for each grazing animal. Example: If the Sandy area were grazed by cattle only, proper use would be 118,790 AUMs; if grazed by sheep only, proper use would be 138,671 AUMs; etc. These figures were developed from the 1964-65 ocular Reconnaissance Range Survey, which is available for review in the Rock Springs District Office. The methodology and an example are shown in Appendix 2I.

lized by mule deer as stated in Chapter 2. The condition of this habitat is primarily fair to good with a static to upward apparent trend. These vegetation types would not be expected to change in size with implementation of this alternative, and the condition of the range should remain about the same as at present in the long term.

Forage reservations consistent with Wyoming Game and Fish Department population estimates have been made on each allotment with a resulting reduction in livestock numbers to accommodate these mule deer numbers. Forage production over the total Sandy area for mule deer would be expected to remain about the same as at present over the long term (TABLES 2-27 and 8-15). Analysis of forage availability from these tables on the crucial winter habitat indicates that forage requirements for the wintering populations within each allotment where this habitat occurs (MAP 2-12) would be adequately satisfied.

Cover. Based on the analysis of food adequacy for mule deer on the Sandy area and projected size and condition of vegetation types, cover requirements should not be affected.

Water. With the class of livestock and use remaining at approximately present levels on mule deer summer habitat and crucial winter habitat, no change in availability of water would be expected.

Space. The space factor should not change from implementation of this alternative. Ease of mobility throughout the Sandy area would be unchanged as a result of this alternative.

Migration. Migrational patterns of mule deer are very isolated and involve less than 50% of the Sandy area. These migration patterns should not be altered by implementation of this alternative.

Elk. Under the present management policy in the Sandy area, a population of 1,165 elk is considered normal and is the desired level according to the Wyoming Game and Fish Department. This figure would be expected to remain constant with implementation of this alternative.

Food. The conifer, mountain shrub, sagebrush-grass, and meadow vegetation types are common in the elk habitat in the Sandy area. Grasses in these types are the primary forage plants utilized by elk. The condition of this habitat is primarily fair to good with a static to upward apparent trend. These vegetation types would not be expected to change in size to any significant degree with implementation of this alternative, and the condition of the range should remain about the same as at present in the long term.

Forage reservations consistent with Wyoming Game and Fish Department population estimates have been made on each allotment, with a resulting reduction in livestock numbers to accommodate the elk numbers. Forage production for elk over the total Sandy area would be expected to remain at about the same level as at present over the long term (TABLES 2-27 and 8-15). Analysis of forage availability from these tables on the crucial winter habitat indicates that forage requirements for the wintering elk population within each allotment where this habitat occurs (MAP 2-13) would be adequately satisfied.

Cover. Based on the analysis of food adequacy for elk on the Sandy area and the projected size and condition of vegetation types, cover requirements should not be affected.

Water. With the class of livestock and use levels remaining at approximately present levels on elk summer and winter crucial habitat, no change in availability of water would be expected.

Space. The concept of adequate space (freedom of movement to acquire the critical elements for survival) would not be impacted by this alternative.

Migration. Elk migration would not be impacted by this alternative.

Moose. Current population levels as estimated by the Wyoming Game and Fish Department are approximately 23% (15 to 20 animals) below the current habitat carrying capacity. Implementation of this alternative would result in the moose population remaining at the current level of approximately 56 animals.

Food. The primary habitat relative to moose are the meadow types during the winter season and the mountain shrub and conifer types during the summer and fall seasons in conjunction with the meadow types. The range condition and trend for moose habitat, including crucial winter habitat, is generally fair to good with a static to upward apparent trend as indicated in Chapter 2.

Implementation of this alternative would not change the size of the vegetation types pertinent to moose habitat. Most of the allotments containing moose habitat would have considerable cattle use with especially heavy use on the meadow types. Plant composition could change slightly on the meadow types with continued cattle use as proposed. However, total production for moose would not be expected to change over the long term (TABLE 8-15). Based on current trend of the range condition, limited change would be expected.

Forage reservations consistent with Wyoming Game and Fish Department population estimates have been made on each allotment, with a resulting reduction in livestock numbers to accommodate the moose numbers. Analysis of forage availability from these tables on the crucial winter habitat indicates that forage requirements for the wintering moose population may not be adequate in some allotments. Willow availability in these allotments would be considered one of the major problems.

Cover. Cover requirements pertinent to moose should be adequately met even with a suspected shortage of forage in the above listed allotments. Population levels would not be dense; therefore, cover should be adequate.

Water. Water requirements should be adequate as moose habitat is generally affiliated with wet meadow areas.

Space. This requirement should not be affected by implementation of this alternative since use levels on moose habitat by livestock should be reduced because of wildlife forage reservations.

Migration. This factor should not be affected since new fences are not proposed within the boundaries of the moose habitat.

Sage Grouse. Current population levels are considered by the Wyoming Game and Fish Department to be at carrying capacity for the Sandy area. This alternative could cause a 5% reduction in current populations.

The sagebrush-grass vegetation type is the primary habitat for sage grouse. The size of this type would not be expected to change with implementation of this alternative, and range condition should remain constant. Based on the food and cover analysis of the other game species common to this vegetation type, adequate forage and cover should be available for sage grouse to maintain themselves. Activated nonuse could cause increased trampling on nesting areas. Adequate cover as predicted should mitigate this impact almost completely.

Water, space, and migration requirements should not be affected by this alternative.

Waterfowl. Current populations (Chapter 2) would be expected to vary an estimated 1 to 5% below normal year to year variations with implementation of this alternative.

Food. Impacts from this alternative on existing food production and availability would be minimal.

Cover. Activated nonuse could cause problems on the cover element for waterfowl when considering potential increased trampling. However, cover should not change greatly since sheep use would remain dominant over the Sandy area where large amounts of nonuse currently are being taken. Sheep use on waterfowl habitat is generally considered to be slight since sheep forage preferences occur outside waterfowl habitat.

Nongame Species. Current populations would be expected to vary an estimated 1 to 5% below normal levels (Chapter 2) for both the short and long terms. Trampling impacts from livestock would be the primary source of damage to nongame species habitat as well as the activation of nonuse.

Food. Forage allocations have been made for all grazing animals on each allotment according to proper use of forage plants common to a given vegetation type. Activation of nonuse should cause a reduction in forage availability for nongame species. However, a reduction in nongame species numbers probably would be necessary to bring the balance of animal numbers in line with present forage availability. Should a reduction occur as expected, it would occur in the short term and stabilize at that level over the long term.

Cover. A balance of forage availability would relate directly to adequate cover for all species in this classification. Activation of nonuse may cause increased trampling, which could affect populations over the short term; long-term impacts should become minimal as conditions stabilize.

Space and Migration. These elements should not change under this alternative from the present situation.

Threatened and Endangered Species. Animal species considered to be threatened or endangered common to the Sandy area are peregrine falcons and black-footed ferrets. Both species are dependent upon nongame animals as a food source and are impacted by the fluctuation in the populations of those animals. The nongame population levels would not be expected to vary more than 5%; therefore, impacts to these two endangered species should be minimal.

Peregrine falcons use ducks as a food source. Fluctuations in duck populations may have some impact on peregrine falcon populations. These impacts should be short-term in nature as conditions tend to stabilize.

Aquatic

Under Alternative 1, continuation of present use, the existing conditions and trends along 300 miles of Sandy streams would be expected to prevail. Activation of the 40% average sheep nonuse would have less impact to stream habitat due to their more extensive utilization of upland areas rather than stream bottoms. With provisions for controlled herding to reduce lambing and bedding use on these bottoms and focus these activities around upland water sites, only site-specific impacts to aquatic habitat would be expected.

More extensive utilization of upland water sites by sheep would result in impacts to aquatic habitat in these areas (shoreline trampling, erosion, increased turbidity, and decreased primary production), but the overall habitat condition of these areas would probably remain the same as the present condition.

In most of the allotments where temporary cattle conversions would become permanent, stream habitat condition would be expected to decline another 20% to 40% over the long term. Those allotments with predominately sheep use (Reservoir, Pacific Creek, Continental Peak, Bush Rim, and Red Desert) would be expected to maintain the present condition of stream habitat (TABLES 2-55 and 2-56). A detailed analysis of habitat conditions is available for review upon request from the Rock Springs District Office.

Wild Horses

Impacts on the wild horses would be minimal since adequate forage would be allotted to support the proposed wild horse numbers. The lack of any fences in the proposed wild horse management areas would be conducive to the free movement and behavioral pattern of the horses. The lack of additional water development would provide areas ungrazed by livestock for the wild horses to utilize without competition.

The action of not allowing nonuse (see Glossary) could create competition for space and forage during the fall in the wild horse management areas. There has been substantial nonuse in these areas for the last eight years (TABLE 1-1). Competition would occur for a short time (two months) annually in the short term. Adequate forage should be left for the horses in the winter after the livestock leave.

Cultural Resources

The proposed increased livestock use could cause damage to artifacts as discussed in Chapter 3. The most significant damage would occur on the severe and heavy grazing intensity used areas for each allotment (TABLE 8-8).

Trampling would lead to erosion along cattle trails and sheet erosion which would damage sites by the vertical and horizontal displacement of artifacts. Over a period of twenty years increased erosion due to livestock trampling would result in a 20 to 25% loss of archeological resources, as sites would be gradually eroded leading to a displacement of artifacts and the loss of other data vital to the interpretation of archeological sites.

More livestock would create a visual intrusion and detract from the prehistoric environment by the introduction of domestic animals which would slightly decrease the public's experience and appreciation of the archeological and pre-1880 historical values.

Fence crossings have a severe impact upon historic trails that are disturbed by heavy modern traffic or other modern intrusions. These fences decrease the quality of the trails' settings and reduce their eligibility for nomination to the National Register of Historic Places. There are currently nineteen fence crossings of trails in the Sandy area (TABLE 8-16).

Visual Resources

The visual effects of this alternative would be site-specific and would be related to trampling in stream bottoms. These effects currently exist throughout the landscape. Change in the visual resource for the area would be negligible. Analysis of visual effects was accomplished using the contrast rating system. The contrast ratings are discussed in Chapter 2 (TABLE 2-65).

Recreation Resources

Recreation experiences would change in quality in the Sandy area. The factors identified in Alternative 1 which would influence visitor use are: (1) trampling and accumulation of feces and (2) the retardation of growth and development of willows on stream bottoms.

Some individuals would tolerate the same site under poorer conditions more than others would. Those who would not tolerate certain site conditions would go elsewhere. The measurement of visitor days is based on that movement. Movement may be to or from Forest Service land, or it may be a shifting of use within the Sandy area between allotments.

The visitor use figures are estimates. Reductions of visitor use shown are more realistic than increased visitor use because improved site character does not necessarily generate a demand to take advantage of it, and a certain amount of the positive or negative movement of people would be within the Sandy area.

The percent changes in visitor use shown on TABLE 8-17 are based upon the same areas as defined in the proposed action. Shifts of boundary lines would have an insignificant effect upon the visitor use figures by allotment and no effect upon the aggregate impact of this alternative on recreation.

TABLE 8-18 serves as an indication of visitor use for comparative purposes between the existing situation and Alternative 1 and for the relative effect of this alternative upon the various recreation activities.

Visitor use would also vary with the base resource in the case of hunting. It is assumed that the visitor use would vary indirectly with animal populations depending upon a wildlife management policy.

A potential hazard from soil and waterborne diseases, including parasites, may occur to recreation seekers. This hazard would be related to livestock grazing. The hazard has not been quantified because of lack of data.

Wilderness Resource

No impacts would result to the wilderness resource from implementation of this alternative.

Livestock Grazing

This alternative would provide 144,401 AUMs (TABLE 8-2) for livestock use in the short term. The existing use is 150,309 AUMs (total of Columns 7, 10, and 12 in TABLE 2-70). This use level was established after making forage reservations for wild horses and wildlife. In the long run, livestock AUMs would be further reduced to 125,551 (TABLE 8-14) because of a decrease in forage production. The reduction of AUMs could not be regained except in the three allotments with proposed grazing systems: Bar X, Fish Creek, and Gold Creek.

There would be no further conversions from sheep use to cattle use (TABLE 8-2), and nonuse would not be allowed except for protection and conservation of the NRL. This would have an impact on those fifteen permittees taking nonuse and wanting to convert sheep AUMs to cattle AUMs. Those permittees who have long-established sheep operations and want to convert partially or entirely to cattle operations would be required to continue their sheep operations. They could try to sell their operations, but this would be difficult if the present trend in sheep ranching would continue.

Farming

This alternative would not create any changes or additional demands on the area's farming activities.

TABLE 8-16

HISTORIC TRAILS CURRENTLY CROSSED BY A FENCE

Trail	Location	Condition of Trail
Oregon Trail	S 26, T 28 N, R 100 W (Burnt Ranch)	Good
Oregon Trail	S 5, 6, T 27 N, R 110 W	Good
Oregon Trail	S 1, 2, 3, 4, T 27 N, R 101 W	Good
Oregon Trail	S 1, T 27 N, R 102 W (Pacific Springs)	Poor
Oregon Trail	S 25, T 27 N, R 103 W	Excellent
Oregon Trail	S 32, T 26 N, R 105 W	Good
Oregon Trail	S 32, T 26 N, R 106 W	Poor
Point of Rocks	S 26, T 28 N, R 100 W (Burnt Ranch)	Good
South Pass Stage Road		
Sublette Cutoff	S 2, T 26 N, R 105 W	Excellent
Sublette Cutoff	S 16, T 26 N, R 106 W	Excellent
Lander Cutoff	S 8, T 28 N, R 100 W	Poor
Lander Cutoff	S 7, T 28 N, R 100 W	Fair
Lander Cutoff	S 11, T 28 N, R 100 W	Fair
Lander Cutoff	S 10, T 28 N, R 100 W	Good
Lander Cutoff	S 2, T 28 N, R 101 W	Poor
Lander Cutoff	S 34, T 29 N, R 102 W	Good
Lander Cutoff	S 30, T 29 N, R 102 W	Good
Lander Cutoff	S 17, T 30 N, R 104 W	Good
Lander Cutoff	S 22, T 30 N, R 105 W	Good

TABLE 8-17

PERCENT CHANGE IN VISITOR USE FROM EXISTING CONDITIONS UNDER ALTERNATIVE 1

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy - Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Change in Percent Use
Sand Dune Rally											0						0
Recreation Vehicle			0	0	0		0	0	0	0	0	0	0			0	0
Camping: Trailer	0	0	0	0	0	0		0	0	0		-20	0	0	0	-20	-4
Dry Camp: Tent	-18	0	0	0		0						+17	0	0	0	0	+4
Tent Camping	-5	0	0	0		0			-14			-20	0	0	-75	-33	-8
Picnic: Dry Camp	+38	0	0	0							0	+11				0	+3
Picnic	-7	0	0	0					0			-30		0		-28	-6
Camping: Camping Areas			0			0						-25	0	0		-25	-2
Picnic: Picnic Areas			0			0						-24	0	0		-24	-2
Hunting																	
Moose	0	0	0						-100			0	0	0	0		-8
Elk	0	0	-10	0	0			0		0	0	0	0	0	0	0	-4
Deer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+4
Antelope	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grouse			0	0					-30			0	0				-21
Sage Grouse	0	0	-5	0	0			-20		-20		+13	0			-25	+1
Dove			0		0					-29	-31			0	0	-50	-23
Goose/Duck						-50								0			-44
Cottontail						0											0
Rock Collecting	0			0	0	0		0	0	0				0			0
Fishing-Stream	0	0	-10	0					-74			-20	0	-33	0	-65	-10
Floatboat/Canoe	0	0	0	0		-30			-35			+5	0	0	+200		+8
Fishing-Reservoir						0								0			0
Boating						0								0			0
Waterskiing						0								0			-2
Swimming						0								0			0
Snow Play	0	0	0									0				0	0
Cross-Country Skiing			-11	0								0					-9
Snowmobile			0	0		0					+5	0					+1
Sightseeing Highway	0		0		0	0				0	0	0		0	0	+11	0
Sightseeing General	0	-40	-40	0	0	0	0	0	0	0	0	0	0	0		-41	-2
TOTALS	-1	-6	-5	0	0	-2	0	-1	-4	-3	0	-13	0	-1	+8	-12	-3

TABLE 8-18

PROJECTED VISITOR DAYS PER YEAR UNDER ALTERNATIVE 1

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy-Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Total Visitor Days
Sand Dune Rally											3,700						3,700
Recreation Vehicle			360	803	278		805	68	35	233	248	315	713			15	3,873
Camping																	
Trailer	622	59	12,323	6,788	29	1,912		440	630	604		6,901	5,267	873	482	37	36,967
Dry Camp	32	4	770	424		106						631	329	56	30	3	2,385
Tent Camping	110	11	2,311	1,273		319			6			1,294	988	164	90	6	6,572
Picnic:Dry Camp	11	2	45	60							67	31				2	218
Picnic	67	18	405	540					30			176		100		13	1,349
Camping:Camping Areas			1,200			5,834						75	700	7,875		75	15,759
Picnic:Picnic Areas			544			66						34	337	51		34	1,066
Hunting																	
Moose	1	1	1						0			1	3	2	2		11
Elk	1	20	394	39	20			37		12	7	90	167	4	41	30	862
Deer	2	3	60	132	33	202	10	62	9	19	17	79	191	6	74	4	903
Antelope	3	5	4	11	12	82	236	28	46	13	21	3	2	3	6	1	476
Grouse			8	2					32			6	6				54
Sage Grouse	29	22	486	2,529	48			76		259		1,371	600			3	5,423
Dove			5		12					29	22			4	2	1	75
Goose/Duck						164								47			211
Cottontail						176					131						307
Rock Collecting	355			412	14	350		225	273	231				48			1,908
Fishing:Stream	30	34	5,126	3,590					11			3,190	2,628	550	500	12	15,671
Floatboat/Canoe	117	33	217	173		723			11			158	300	200	651		2,583
Fishing:Reservoir						6,911								758			7,669
Boating						1,100								248			1,348
Waterskiing						62								102			164
Swimming						132								8			140
Snowplay	56	56	222									28				139	501
Cross-Country Skiing			92	2								20					114
Snowmobile			117			39					433	210					799
Sightseeing Highway	60		180	210		946				752	705	180		598	230	133	3,994
Sightseeing General	85	28	967	4,477	771	688	549	419	395	100	2,000	3,196	4,623	10,186		13	28,497
TOTALS	1,581	296	25,837	21,465	1,217	19,812	1600	1,355	1,478	2,252	7,351	17989	16,854	21,883	2108	521	143,599

No figures available for hiking, backpacking, and horseback riding.

Socioeconomic Conditions

The no action alternative would have two primary income impacts by Year 23. AUMs available to livestock (private, State, and Federal) would decrease by 24,737 per year (TABLES 2-24 and 8-14), resulting in a loss of $523,806 in annual total income to the area. Total annual income from recreation activities would decline by $27,835 per year. Income from recreation activities would decline by $72,113 per year. (See recreation analysis and Chapter 3 socioeconomic conditions section.)

The elimination of rancher nonuse of licensed AUMs would actually increase grazing on the Sandy area, resulting in the generation of nine additional agricultural sector jobs by Year 23.

The impacts to resident and user attitudes and expectations would primarily be concerned with the flexibility they desire in their operations. This alternative allows one-time conversions from sheep to cattle use. While this would allow some ranchers to switch to what they consider to be a more profitable operation, it would still limit them in making conversions at will. Many would feel that the government was still interfering in their lives and ability to earn a living according to their own determinations.

See APPENDIX 3E and the Chapter 3 socioeconomic conditions section for methodologies used in this analysis.

ALTERNATIVE 2-DISCONTINUATION OF LIVESTOCK GRAZING

DESCRIPTION

Under this alternative, domestic livestock would be removed from NRL and no new AMPs would be developed. The already implemented Bar X, Fish Creek, Gold Creek, and Pine Creek AMPs would be abandoned. Trailing permits would be issued for livestock crossing national resource land (NRL) for access to national forests to the north, the checkerboard land to the south, or to private and State-owned land.

Total forage available to wildlife and wild horses within the Sandy area under proper use for this alternative would be 572,668 AUMs. A breakdown by animal species is available for review in the Rock Springs District Office.

Existing fences on national resource lands within the Sandy area would be removed to benefit wildlife and wild horse movements, except for the northern boundary fence of the Sandy area, the Rock Springs-Rawlins District boundary fence, the Farson-Eden Project boundary fence, and Highways 187 and 28 rights-of-way fences (MAP 8-2, located at the end of this chapter). A new three-wire fence would be constructed along the checkerboard boundary in accordance with the wild horse management plans to keep wild horses from migrating onto the checkerboard lands. It would also keep livestock from migrating from the checkerboard land onto the Sandy area.

Section 4 permits (see Glossary) would be cancelled, and the operators would have approximately two years to remove improvements from NRL within the individual use pastures and claim their materials. Cooperative agreements (see Glossary) would be cancelled and improvements on NRL would be removed by BLM (MAP 8-2 and TABLE 8-19). Existing water developments would be left to benefit wildlife and wild horses. New range improvements would only be constructed or maintained where needed for wild horse and wildlife benefits.

Increased range supervision by BLM would be necessary to assure that operators would adhere to conditions of trailing permits and that livestock on private or state land would not stray onto adjacent NRL. Administrative actions related to unauthorized use (trespass) would be taken in accordance with BLM Manual 9230. State and private land within the Sandy area would not be fenced out by BLM to eliminate trespass of livestock on NRL. Wyoming fence law provides that on open range it is the responsibility of the individual operators to control livestock from straying onto adjacent land.

ANALYSIS OF ALTERNATIVE 2 IMPACTS

Impacts on the environment's resources and land uses that would or could occur as a result of implementation of this alternative are analyzed in two stages: short term (eleven years following completion of this statement, or 1988) and long term (23 years following completion of this statement, or 2000). The analysis follows the same general pattern used to analyze the proposed action.

While it is recognized that such a drastic change in the use and management of the Sandy area as eliminating a major industry (livestock grazing) could have adverse environmental effects on private and State lands within the area, these impacts cannot be analyzed without developing an extensive set of alternatives for each distinct tract of private land. Among the possibilities for each tract would be: intensification of agricultural use to any number of degrees; subdivision; recreational development; and conversion to other public ownership through nonpayment of taxes. Due to the Bureau's inability to forecast or control these options, analysis of impacts was necessarily limited to the NRL (93% of the area).

Soils

Sheet Erosion

Under this alternative, ground cover would be expected to increase and would reduce the estimated sheet erosion rate in the Sandy area by 529,224 tons per year to a total of approximately 7,849,386 tons per year in 23 years (TABLE 8-20). Long-term reductions would vary within the allotments, depending upon the soil associations present. Proposed action allotment boundaries are used in this alternative for the purpose of analysis and comparison. A detailed analysis by soil associations in each pas-

TABLE 8-19

PROPOSED FENCE CONSTRUCTION AND REMOVAL UNDER ALTERNATIVE 2

FENCES TO BE REMOVED

EXISTING ALLOTMENTS	FENCE (MILES)	COST $100/MILE
Bar X	11	$1,100
Fish Creek	11	$1,100
Gold Creek	19	$1,900
Subtotal	41	$4,100

EXISTING INDIVIDUAL USE PASTURES	FENCE (MILES)	TOTAL COST ($100/MILE)
I-1	2	200
I-2	2	200
I-3	2	200
I-4	1	100
I-5	2	200
I-6	4½	450
I-7	1½	150
I-8	½	50
I-9	½	50
I-10	1	100
I-11	1½	150
I-12	½	50
I-13	½	50
I-14	½	50
I-15	5	500
I-16	½	50
I-17	3	300
I-18	2	200
I-19	2	200
I-20	½	50
I-21	5	500
I-22	½	50
I-23	1	100
I-24	9	900
I-25	8	800
I-26	2½	250
I-27	1	100
I-28	4	400
I-29	½	50
I-30	1½	150
I-31	1½	150
I-32	½	50
I-33	½	50
Buckskin-Sandy	4½	450
Subtotal	73	$7,300

NEW FENCE CONSTRUCTION

ALLOTMENT WITH CHECKERBOARD BOUNDARY FENCE	FENCE (MILES)	COST $2,100/MILE)	CATTLE-GUARDS	COST ($1,600 EA.)
Little Colorado	42	$88,200	4	$ 6,400
Sands	25	$52,500	5	$ 8,000
Steamboat	10	$21,000	2	$ 3,200
Red Desert	33	$69,300	4	$ 6,400
	110	$231,000	15	$24,000

TABLE 8-20

LONG-TERM SHEET EROSION UNDER ALTERNATIVE 2

Allotment	Acres	Geologic Erosion Tons/Yr.	Other Sheet Erosion Tons/Yr.	Total Sheet Erosion Tons/Yr.
Bar	6,895	6,330	8,409	14,739
Fish Creek	7,237	6,643	10,127	16,770
Gold Creek	30,525	28,023	33,243	61,266
Little Sandy-Little Prospect	185,660	168,437	473,765	642,202
Steamboat Mountain	40,537	37,213	648,093	685,306
Little Colorado Green River Use Area	303,791	278,881	287,113	565,994
Farson Use Area	205,123	188,302	387,200	575,502
Big Sandy Use Area	218,042	200,163	382,885	583,048
Red Desert	245,375	225,254	408,830	634,084
Bush Rim	104,547	95,974	703,668	799,42
Continental Peak	88,478	81,223	559,720	640,943
Pacific Creek	202,856	186,223	1,235,471	1,421,694
Sands	114,852	105,434	423,673	529,107
White Acorn	46,794	42,956	134,608	177,564
Prospect Mountain	66,751	61,276	136,518	197,794
Reservoir	35,545	32,631	62,037	94,668
Poston	50,635	46,483	130,873	177,356
Pine Creek	14,089	12,934	18,773	31,707
TOTALS	1,967,732	1,804,380	6,045,006	7,849,386

ture is available for review upon request from the Rock Springs District Office.

The Musgrave Equation was used to compute the changes in sheet erosion rates. These calculations are dependent on projected long-term increases in vegetal and total ground cover (TABLE 8-24), which were used to adjust the ground cover factor in the equation. APPENDIX 2B outlines how these calculations were made.

An analysis of soils in the area indicates that Mapping Units 132, 233, and 333 would continue to erode at high rates. Large areas of these soils in the Steamboat Mountain, Bush Rim, Continental Peak, and Pacific Creek Allotments (88,630 acres) would continue to contribute to the high erosion rates of these areas.

Modest increases in ground cover over mapping units with a sagebrush-grass vegetation type on slopes of 0 to 15% would be expected to have the greatest reductions in sheet erosion. These units—114, 116, 121, 123, 124, 127, 220, 221, 222, 223, 224, 228, and 328—cover more than 39% (787,695 acres) of the area and involve portions of the Little Colorado, Sands, Prospect Mountain, Reservoir, and Poston Allotments.

Large increases in ground cover over mapping units with meadow or grass vegetation types on slopes of 0 to 3% would be expected to have little effect in reducing sheet erosion. These nearly level soils are well covered with vegetation and produce little in the way of sheet erosion.

Limited ground cover improvement would be expected on soils with saltbush-winterfat, greasewood, conifer, mountain shrub, and perennial forb vegetation types (see vegetation analysis, TABLE 8-24). Erosion would continue at present rates on these types.

The guidelines for acceptable average erosion per pasture (Soil Conservation Service 1973) were used to determine the acres of erosion by class under this alternative. The excessive erosion category would decrease by 84,206 acres to 335,428 acres (TABLES 2-4 and 8-21). The moderate average erosion per pasture would occur on 1,328,513 acres, down 89,252. The light erosion category would be up 173,458 acres, reflecting decreases in the moderate and excessive categories.

Wind Erosion

See Alternative 1 for relative analysis as impacts are the same.

Compaction

Under this alternative all livestock grazing would cease and those acres presently being compacted by livestock would no longer be compacted. Compaction is occurring on approximately 69,000 acres (TABLE 2-6, heavy and severe grazing intensity categories) of the Sandy area. Increased infiltration and decreased runoff and erosion would be the result of no grazing. Studies at Badger Wash (Lusby et al. 1974) indicate a reduction of as much as 40% in runoff and erosion as a result of resting heavily grazed areas. The present average sheet erosion rate for the Sandy area (8,378,610 tons per year divided by 1,967,732 acres equals 4.26 tons per acre per year) multiplied by the 69,000 acres believed to be receiving significant compaction yields 293,940 tons of onsite sediment per year. A 40% reduction of this figure would mean 117,576 tons per year less sediment.

Water Resources

Water Use

Consumptive water requirements of livestock would be essentially zero under this alternative; however, livestock trailing across national resource lands would require water. Water use by wildlife would increase as populations increase.

Evaporation losses from reservoirs would remain at existing levels (876 acre-feet per year) as existing waters would be maintained for wildlife and wild horses.

Streamflow

Changes in runoff from Alternative 2 would have no measurable effect on annual perennial streamflow (see Chapter 3 streamflow discussion). However, storm runoff would decrease 42% in volume due to an increase in infiltration rates (TABLE 8-22). Refer to Alternative 1 for streamflow and storm runoff analysis.

Water Quality

This alternative would have no measurable effect on water quality in perennial streams within the Sandy area or downstream. As perennial streamflow would not be expected to change, sediment transport would remain unchanged in perennial streams (see Chapter 3 streamflow discussion). However, sediment yield in the intermittent streams in the Sandy area would decrease proportionally to the decrease in storm runoff (TABLE 8-22).

The PSIAC method (APPENDIX 2F) was applied to Alternative 2, and these calculations indicate there would be a 19% decrease in total sediment yield from existing levels. Total sediment yield would be 1,592,357 tons per year.

Channel stability potential is the level that could be reached by removing the physical damages to a stream. Channel stability would increase to the potential level identified in the survey data (TABLE 8-23); however, the recovery rate would be slow (10-15 years) reaching the potential level.

The concentration of dissolved solids would decrease during runoff events in the intermittent streams within the Sandy area due to a decrease in upland sediments (Chapter 3 water resources). Sediment has been identified as a major factor in salinity levels (Chapter 3 water resources).

Fecal coliforms (indicators of bacteriological contamination) from livestock grazing on national resource land

TABLE 8-21

ACREAGES OF EROSION BY CLASS UNDER ALTERNATIVE 2

Allotment	Light*	Moderate*	Excessive*
Bar X		6,895	
Fish Creek		7,237	
Gold Creek		30,525	
Little Sandy-Little Prospect		185,660	
Steamboat Mountain			40,537
Little Colorado			
Green River Use Area	303,791		
Farson Use Area		205,123	
Big Sandy Use Area		218,042	
Red Desert		245,375	
Bush Rim		32,533	72,014
Continental Peak			88,478
Pacific Creek		68,457	134,399
Sands		114,852	
White Acorn		46,794	
Prospect Mountain		66,751	
Reservoir		35,545	
Poston		50,635	
Pine Creek		14,089	
	303,791	1,328,513	335,428

*Light - less than 2 tons per acre per year; Moderate - 2 to 5 tons per acre per year; Excessive - greater than 5 tons per acre per year. A detailed analysis by pasture is available for review at the Rock Springs District Office.

TABLE 8-22

MODEL STORM RUNOFF BY ALLOTMENT UNDER ALTERNATIVE 2
(10-YEAR STORM)

Allotment*	Runoff in Acre-Feet Existing	Long And Short Term
Bar X	1.5	0.8
Fish Creek	0.9	0.5
Gold Creek	16.5	8.7
Little Sandy-Little Prospect	45.1	21.1
Steamboat Mountain	120.8	24.9
Little Colorado	14.7	11.5
Red Desert	58.2	29.1
Bush Rim	66.9	10.0
Continental Peak	82.9	67.4
Pacific Creek	58.2	64.7
Sands	2.0	0.1
White Acorn	12.8	8.4
Prospect Mountain	11.4	4.5
Reservoir	22.1	16.2
Poston	15.5	9.7
Pine Creek	2.2	1.2
Weighted Mean	29.5	17.06
Percent Change		-42%

*See MAP 1-5 for details.

TABLE 8-23

PROJECTED CHANNEL STABILITY RATINGS UNDER ALTERNATIVE 2*

Allotment1/	Stream Miles	Average Present	Average Long Term 2/
Bar X	9.00	99.0	79.0
Fish Creek	5.50	92.4	83.5
Gold Creek	39.00	95.6	90.2
Little Sandy-Little Prospect	42.25	103.3	91.5
Steamboat Mountain	9.50	110.0	89.0
Little Colorado			
Green River Area	30.00	85.9	77.7
Big Sandy Area	30.25	102.2	94.6
Continental Peak	6.25	99.0	79.0
Pacific Creek	48.00	106.9	92.2
White Acorn	22.75	95.9	81.1
Prospect Mountain	24.75	103.1	98.2
Reservoir	14.75	110.0	111.0
Poston	3.00	104.0	104.0
Pine Creek	10.50	97.2	92.4
AVERAGE CSR		100(Low Fair)	90(High Fair)
Total Miles	295.50		
Percent Change			10%

*Channel Stability Rating	Condition
Less Than 38	Excellent
39-76	Good
77-95	High-Fair
96-114	Low-Fair
115 or More	Poor

1/See MAP 1-5 for details.

2/This is the potential for the channel rating and would be reached in 10 to 15 years.

would be eliminated; however, information is not available on the effects of livestock on fecal coliform levels in the Sandy area.

Vegetation

Vegetation Types

The limited grazing pressure from wild horses and wildlife would allow vegetation to attain its full vigor potential within the short term (eleven years), except around waters where concentrations of wild horses are found in summer. Full growth and maturity by plants each year would allow them to replenish root reserves and produce seed. This should allow the various species to propagate themselves and increase their percent composition slowly, as well as increase in percent vegetal cover.

Plant composition would not change measurably except in those areas of poor condition range as a result of past overgrazing. Seedlings would be established in these areas, and the plant composition would slowly change. Forage that would otherwise be utilized by livestock would become litter and gradually be incorporated into the soil. Increased plant litter should result in less bare ground. Ground cover could increase as much as 25% in the long term (TABLE 8-24).

Forage Production

Forage production on the Sandy area would increase to its site potential through a build up of plant reserves (vigor) over a period of three to five years. Production would peak out after this point and remain stable for the next 15 to 20 years. Predicted long-term production can be found in TABLE 8-25.

Range Condition and Trend

The condition of the range should be approaching the good rating from an ecological aspect by the end of the 23-year period. The more desirable species should slowly reestablish themselves in the poor condition areas and litter would accumulate on all areas. An upward trend in range condition would be expected for all vegetation types.

Fence Construction. Fencing would be limited to the construction of the checkerboard fence, the southern boundary of the Sandy area.

Threatened or Endangered Plants

The two plants identified in Chapter 2 would respond similarly to other vegetation and propagate accordingly.

Vegetation Production

The long-term production for cattle would be an estimated 161,807 AUMs; an estimated 186,299 AUMs for sheep; 89,287 AUMs for wild horses; 189,730 AUMs for pronghorn antelope; 208,221 AUMs for mule deer; 75,581 AUMs for elk; and 9,849 AUMs for moose (see TABLES 8-25 and 8-26). Estimations were made using the same criteria explained in Alternative 1 vegetation analysis.

Wildlife

Terrestrial

Impacts from this alternative would affect the populations of the four major wildlife species (pronghorn antelope, mule deer, elk, and moose), as well as sage grouse, waterfowl, and numerous nongame species. The primary factors relative to the impacts on wildlife populations to be considered are food, water, cover, space, and migration habits and the conditions and availability of each factor. The population impacts shown portray a worst case situation that could result only if all potential adverse conditions were to occur simultaneously. Projected populations are based on a summarized qualitative analysis of various elements outlined in the description of the alternative. A detailed analysis by critical element is available for review in the Rock Springs District Office.

Pronghorn Antelope. The carrying capacity of the pronghorn crucial winter habitat would increase approximately 165% within the short term as a result of this alternative (TABLE 8-26). This estimate is made by drawing a parallel to Elroy Taylor's study in the Red Desert (1975) relating to livestock grazing and fencing removals. He wrote that there is a direct relationship between population and carrying capacity during the critical time of survival. If applicable to the Sandy area, it would mean that the pronghorn population could increase from the currently estimated 9,500 animals to approximately 25,000 animals.

Food, Water, Cover, and Space. Taylor notes in his 1975 study that "livestock competition affects antelope numbers more than fences do, fencing alone has reduced antelope carrying capacity by 28.4%" Without livestock grazing and fences, more forage would be available; fewer injuries would occur; conditions for seasonal escape from weather and escape from predators would be improved; better cover and more water would be available; and young would not have to compete with livestock for lush, green, spring growth.

Migration. This factor would not change greatly from the present situation concerning access to crucial winter habitat. This is because the fences around the Eden-Farson farming area would remain, and fencing does not occur in the Sands Allotment, where the remainder of this type of habitat occurs. The highway fences would remain and are considered under current conditions to present the greatest problem to migrating pronghorn.

Mule Deer. The implementation of Alternative 2 would cause the mule deer population to increase by 75 to 165% above present levels, reaching as many as

TABLE 8-24

PREDICTED LONG-TERM AVERAGE PERCENT GROUND COVER AND VEGETAL COVER UNDER ALTERNATIVE 2

	Vegetation Types															
	Sagebrush Grass		Saltbush-Winterfat		Grease-wood		Meadow		Grass		Perennial Forbs		Mountain Shrub		Conifer	
Allotments	Ground Cover %	Vegetal Cover %	Ground Cover %	Vegetal Cover %	Ground Cover %	Vegetal Cover %	Ground Cover %	Vegetal Cover %	Ground Cover %	Vegetal Cover %	Ground Cover %	Vegetal Cover %	Ground Cover %	Vegetal Cover %	Ground Cover %	Vegetal Cover %
Bar X	48	17					94	30								
Fish Creek	40	15					91	26								
Gold Creek	33	17					84	25					79	18	78	9
Willow Creek	33	17					73	25					79	18	78	9
Little Sandy-Little Prospect	39	13					95	30					77	12		
Steamboat Mountain	49	11			56	12	69	22			16	6	79	18		
Little Colorado	30	17	23	15	28	11	54	32	27	23					27	12
Red Desert	27	14	27	9	22	6			18	15	16	9				
Bush Rim	28	13	42	11	14	16	97	18	18	15	16	12	64	19	78	9
Continental Peak	47	16	16	7	74	11	97	19	18	14	22	14	94	19		
Pacific Creek	40	14	68	6	22	21	90	17	47	12	11	12	94	16	76	11
Sands	32	15			14	12	75	23	32	16	11	12			74	8
White Acorn	54	16					85	29					53	14	78	11
Prospect Mountain	40	15					70	30					77	16	93	3
Reservoir	35	12					61	28								
Poston	31	13					64	30								
Pine Creek	56	15					72	26								
TOTAL AVERAGES	39	15	35	10	33	13	79		27	16	15	11	77	17	73	9

TABLE 8-25

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 2 BY ANIMAL CLASS
IN AUMS AND POUNDS OF DRY WEIGHT FORAGE

Allotment	Cattle and Domestic Horses		Sheep		Wild Horses	
	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
1. Bar X	847,080 (1,086)	0 (0)	933,750 (1,245)	0 (0)	0 (0)	0 (0)
2. Fish Creek	1,015,560 (1,302)	0 (0)	1,027,500 (1,370)	0 (0)	0 (0)	0 (0)
3. Gold Creek	2,825,160 (3,622)	0 (0)	2,579,250 (3,439)	0 (0)	0 (0)	0 (0)
3a. Willow Creek	701,220 (899)	0 (0)	654,750 (873)	0 (0)	0 (0)	0 (0)
4. Little Sandy	8,538,660 (10,947)	0 (0)	9,302,250 (12,403)	0 (0)	0 (0)	0 (0)
4a. Little Prospect	5,692,440 (7,298)	0 (0)	6,201,000 (8,268)	0 (0)	0 (0)	0 (0)
5. Steamboat Mountain	1,811,160 (2,322)	0 (0)	2,405,250 (3,207)	0 (0)	0 (0)	0 (0)
6. Little Colorado	43,127,760 (55,292)	0 (0)	45,432,000 (60,576)	0 (0)	49,762,800 (55,292)	1,620,000 (1,800)
7. Red Desert	15,323,880 (19,646)	0 (0)	17,439,000 (23,252)	0 (0)	17,681,400 (19,646)	4,749,300 (5,277)
8. Bush Rim	5,534,100 (7,095)	0 (0)	7,293,750 (9,725)	0 (0)	6,385,500 (7,095)	1,206,000 (1,340)
9. Continental Peak	5,658,120 (7,254)	0 (0)	6,844,500 (9,126)	0 (0)	6,528,600 (7,254)	1,064,700 (1,183)
10. Pacific Creek	13,363,740 (17,133)	0 (0)	15,165,000 (20,220)	0 (0)	0 (0)	0 (0)
11. Sands	4,208,100 (5,395)	0 (0)	5,264,250 (7,019)	0 (0)	0 (0)	0 (0)
12. White Acorn	4,610,580 (5,911)	0 (0)	4,369,500 (5,826)	0 (0)	0 (0)	0 (0)
13. Prospect Mountain	5,889,780 (7,551)	0 (0)	6,139,500 (8,186)	0 (0)	0 (0)	0 (0)
14. Reservoir	2,063,100 (2,645)	0 (0)	2,137,500 (2,850)	0 (0)	0 (0)	0 (0)
15. Poston	3,502,200 (4,490)	0 (0)	4,392,750 (5,857)	0 (0)	0 (0)	0 (0)
16. Pine Creek	1,496,820 (1,919)	0 (0)	2,142,750 (2,857)	0 (0)	0 (0)	0 (0)
TOTALS	126,209,460 (161,807)	0 (0)	139,724,250 (186,299)	0 (0)	80,358,300 (89,287)	8,640,000 (9,600)

TABLE 8-25 (Cont'd)

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 2 BY ANIMAL CLASS
IN AUMS AND POUNDS OF DRY WEIGHT FORAGE

Allotment	Antelope		Deer		Elk		Moose	
	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
1. Bar X	561,782 (697)	81,406 (101)	626,430 (1,330)	120,576 (256)	0 (0)	0 (0)	0 (0)	0 (0)
2. Fish Creek	807,612 (1,002)	95,914 (119)	1,047,504 (2,224)	120,576 (256)	0 (0)	0 (0)	359,100 (665)	58,320 (108)
3. Gold Creek	1,848,964 (2,294)	311,922 (387)	2,177,904 (4,624)	182,277 (1,495)	2,266,380 (4,197)	952,560 (1,764)	631,260 (1,169)	140,940 (261)
3a. Willow Creek	475,540 (590)	91,884 (114)	527,520 (1,120)	170,502 (362)	814,860 (1,509)	388,800 (720)	153,900 (285)	34,020 (63)
4. Little Sandy	12,993,526 (16,121)	1,300,884 (1,614)	13,217,202 (28,062)	3,508,008 (7,448)	2,979,180 (5,517)	2,624,400 (4,860)	963,360 (1,784)	726,840 (1,346)
4a. Little Prospect	7,963,280 (9,880)	301,444 (374)	8,101,200 (17,200)	2,149,644 (4,564)	1,905,120 (3,528)	2,733,480 (5,062)	854,280 (1,582)	644,220 (1,193)
5. Steamboat Mountain	1,912,638 (2,373)	390,910 (485)	1,964,070 (4,170)	186,516 (396)	1,979,640 (3,666)	233,280 (432)	0 (0)	0 (0)
6. Little Colorado	50,401,598 (62,533)	6,454,448 (8,008)	9,892,884 (21,004)	427,197 (907)	1,298,700 (2,405)	0 (0)	0 (0)	0 (0)
7. Red Desert	14,628,094 (18,149)	2,005,328 (2,488)	631,611 (1,341)	90,432 (192)	1,723,680 (3,192)	298,080 (552)	0 (0)	0 (0)
8. Bush Rim	6,655,142 (8,257)	965,588 (1,198)	4,035,528 (8,568)	409,770 (870)	5,637,600 (10,440)	518,400 (960)	0 (0)	0 (0)
9. Continetal Peak	6,589,050 (8,175)	770,536 (956)	5,842,284 (12,404)	839,793 (1,783)	324,000 (600)	304,020 (563)	27,000 (50)	25,380 (47)
10. Pacific Creek	17,232,280 (21,380)	2,018,224 (2,504)	18,000,678 (38,218)	801,171 (1,701)	10,014,840 (18,546)	1,373,760 (2,544)	187,380 (347)	178,200 (330)
11. Sands	7,804,498 (9,683)	961,558 (1,193)	8,835,960 (18,760)	480,420 (1,020)	7,853,220 (14,543)	686,880 (1,272)	53,460 (99)	50,760 (94)
12. White Acorn	3,245,762 (4,027)	499,720 (620)	3,435,945 (7,295)	1,337,169 (2,839)	1,885,140 (3,491)	1,607,040 (2,976)	1,084,320 (2,008)	291,600 (540)
13. Prospect Mountain	8,454,134 (10,489)	710,892 (882)	9,090,771 (19,301)	1,337,169 (2,839)	1,868,940 (3,461)	1,739,880 (3,222)	450,900 (835)	320,760 (594)
14. Reservoir	3,929,250 (4,875)	388,492 (482)	3,968,646 (8,426)	617,481 (1,311)	0 (0)	0 (0)	145,800 (270)	61,560 (114)
15. Poston	6,493,942 (8,057)	388,492 (482)	5,599,248 (11,888)	51,339 (109)	0 (0)	0 (0)	87,480 (162)	59,400 (110)
16. Pine Creek	925,288 (1,148)	112,840 (140)	1,076,706 (2,286)	179,922 (382)	262,440 (486)	123,120 (228)	320,220 (593)	58,320 (108)
TOTALS	152,922,380 (189,730)	17,850,482 (22,147)	98,072,091 (208,221)	13,531,830 (28,730)	40,813,740 (75,581)	13,583,700 (25,155)	5,318,460 (9,849)	2,650,320 (4,908)

TABLE 8-26

PREDICTED LONG-TERM FORAGE PRODUCTION FOR MAJOR ANIMAL SPECIES IN THE SANDY AREA WITH IMPLEMENTATION OF ALTERNATIVE 2

Species	AUMs*	Animal Months Provided	Pounds Available Dry Weight Forage
Cattle	161,807	161,807	126,209,460
Sheep	186,299	931,495	139,724,250
Wild Horses	89,287	89,287	80,358,300
Pronghorn Antelope	189,730	2,770,058	152,922,380
Mule Deer	208,221	1,041,105	98,072,091
Elk	75,581	113,372	40,813,740
Moose	9,849	9,849	5,318,460

*These figures represent the total proper use grazing capacity for each grazing animal. Example: If the Sandy area were grazed by cattle only, proper use would be 118,790 AUMs; if grazed by sheep only, proper use would be 138,671 AUMs; etc. These figures were developed from the 1964-65 ocular Reconnaissance Range Survey, which is available for review in the Rock Springs District Office. The methodology and an example are shown in Appendix 2I.

13,700 animals over the long term. This increase in mule deer would be due to removal of livestock and fences from the range, eliminating livestock competition and death loss to fence entanglement.

Food. Vegetation types used by deer would not be expected to change in size with implementation of this alternative. The condition of the range should improve in those areas showing poor to fair condition to good condition in the long term. Forage production over the total Sandy area for mule deer would be expected to increase to at least the levels indicated for long-term production (TABLE 8-26) found in the vegetation analysis. Analysis of forage availability on the crucial winter habitat indicates that forage requirements for the wintering populations within each allotment where this habitat occurs (MAP 2-23) would be adequately satisfied.

Cover. Based on the analysis of food adequacy for mule deer on the Sandy area and the habitat types showing improvement in condition, cover requirements should be adequate within the Sandy area. The proposed three-wire checkerboard boundary fence could reduce mule deer mobility should they be required to migrate farther south than normal into the checkerboard lands during severe winters to obtain adequate cover for survival (MAP 2-23).

Space. The space factor and mobility should be improved from implementation of this alternative when considering that fences on NRL would be removed. The checkerboard boundary fence would cause impacts on space for animals crossing back and forth either on a daily basis or when movement would be necessary farther south than the Sandy area due to adverse weather conditions.

Migration. Migration patterns of mule deer are very isolated and involve less than 50% of the Sandy area. These patterns should not be altered by implementation of this alternative. The only exception would be where migration routes cross the proposed checkerboard boundary fence (MAP 2-23).

Elk. Under this alternative elk would be expected to increase by 165 to 200% above present numbers (Chapter 2) to as many as 3,500 animals.

Food. Vegetation types used by elk would not be expected to change in size to any significant degree with implementation of this alternative, but the condition of the range should improve in those areas showing poor to fair condition to good condition in the long term. Forage production for elk over the total Sandy area would be expected to increase to at least the levels indicated for long-term production predicted in TABLE 8-26. Analysis of forage availability on the crucial winter habitat (MAP 2-24) indicates that forage requirements would be adequately satisfied.

Cover. Based on the analysis of food adequacy for elk on the Sandy area and the habitat types showing improvement in condition, cover requirements should be adequate within the Sandy area. Access to a portion of the crucial winter range for necessary cover could be somewhat impaired during severe weather conditions due to the proposed checkerboard boundary fence. Elk losses attributable to this fence would be minor except during extreme weather conditions such as heavily crusted and deep snow. These conditions would contribute greatly to a weakened condition of the elk, which could cause the elk to have difficulty negotiating the fence.

Space. Space should improve following implementation of this alternative because fences on NRL would be removed. Impacts to elk as a result of the three-wire checkerboard boundary fence are described in the cover analysis above.

Migration. The migration of elk which summer in the Oregon Buttes and Continental Peak areas would occur across the checkerboard boundary, and the identified impacts on elk from the proposed fence would be long term in nature. The elk in the Prospect Mountain area as identified in Chapter 2 would not be impacted during migration due to the proposed removal of all fences on NRL.

Moose. Implementation of this alternative would cause the moose population to increase 165 to 350% above current levels, reaching as many as 270 animals.

Food. Implementation of this alternative would not cause a change in size of any of the vegetation types pertinent to moose habitat; the livestock use would be eliminated, thus allowing it to steadily improve in quality over the long term. Plant composition should change considerably on the meadow types where invader shrubs and forbs are common as a result of past heavy use. Willow availability would be expected to improve over the long term. Total production for moose would also be expected to improve over the long term (TABLE 8-26). Range condition for moose should improve to a good rating over the Sandy area in the long term.

Analysis of forage availability on the crucial winter habitat indicates that forage requirements for the moose population would be adequate in all allotments.

Cover. Cover requirements for moose should be adequately provided as vegetation conditions steadily improve.

Water. Water requirements should be adequate as moose habitat is generally associated with wet meadow areas.

Space and Migration. These requirements should be improved since all fences on NRL would be removed.

Sage Grouse. This alternative could cause an increase of 5 to 20% in the short term. Over the long term, current populations could increase by as much as 30%.

Food and Cover. The range condition of sage grouse habitat should improve. Based on the food and cover analysis of the other game species, adequate forage and cover should be available for sage grouse to maintain themselves.

Space. The adequacy of this requirement should improve from the present situation because livestock would be removed.

Waterfowl. Current populations of ducks would be expected to increase by 30% over the long term because of elimination of livestock trampling (Gjersing and Mundinger 1975).

Food and Cover. These factors should improve under this alternative because foraging by livestock along

streams and ponds would be eliminated. Removal of livestock would eliminate trampling of nesting grounds.

Space and Migration. This element should improve over the present situation just from the removal of livestock.

Threatened or Endangered Species. Animal species considered to be threatened or endangered common to the Sandy area are peregrine falcons and black-footed ferrets. Both species are dependent upon the populations of nongame species as a food source and are impacted by the fluctuation in those population levels. The nongame population levels would be expected to increase by 10 to 30%; therefore, the possibility of these two species to increase in number would be greatly improved.

Range Improvements. All existing fences on NRL within the Sandy area would be removed; thus fence-related injuries and barrier problems during severe weather conditions would be eliminated.

Aquatic

Alternative 2 would result in an immediate recovery of depressed areas over the short term. In the long-term a 10 to 20% improvement of stream habitat would occur in association with those channel stability improvement potentials noted in the water resources analysis (TABLE 8-23). Over the short term, the most immediate improvement of aquatic habitat would be related to bank stabilization by grasses, forbs, and willows, reducing sedimentation.

Long-term changes would be more closely associated with improved deep-rooted bank stabilization and shading by willows which would, in turn, improve both riffle and pool habitat quality. However, Platts noted in his Bear Valley Creek, Idaho, studies (1972) that as much as 33% bank damage may still occur on streams in rested areas which receive trailing use. If trailing use through the Sandy area would be limited to upland areas, the associated site-specific impacts could be greatly reduced or eliminated. A 50 to 70% improvement of aquatic habitat productivity and fish populations could also be anticipated as a long-term impact.

Wild Horses

This alternative would provide a surplus of forage for the number of horses proposed in the wild horse management plans. The competition between wildlife and wild horses should be insignificant because the horse numbers proposed would require only 9,600 AUMs.

The elimination of livestock and removal of fences would be conducive to the free roaming nature of wild horses. The only limiting factors on movement and location of wild horses would be water, fences around the private and State land, and the checkerboard boundary fence. The wild horses could change some of their present areas of use if water would be made available.

CulturalResources

Under this alternative damage to archeological and historical sites from direct trampling and sheet erosion caused by trampling would be eliminated because livestock would be removed from the Sandy area. Trailing could have a slightly adverse impact, as the animals would trample any sites they would go through, causing breakage of artifacts as well as displacement from their location. This impact would be slight for any single time a herd would move across a site; however, if the same trails are used year after year, the cumulative effect could be severe.

In locations where historic trail remains have not been seriously altered, the construction of a fence would cause a severe visual impact which would lessen the experience of individuals visiting these locations. The construction of the checkerboard boundary fence would affect the trails in TABLE 8-27 in the manner described above.

The removal of fences where they are currently in place would enhance the experience of individuals traveling the trails (TABLE 8-28). In addition, the removal of these fences would increase the chances of at least three historic and prehistoric sites being eligible for inclusion on the National Register of Historic Places as visual impediments would be removed (TABLE 2-63).

Visual Resources

In terms of visual contrast and contrast rating, Alternative 2 would be virtually identical to the existing contrast shown on TABLE 2-65. This is because the visual contrasts in the Sandy area are primarily due to such manmade disturbances as roads and trails, powerlines, oil wells, and similar developments. The real impact of Alternative 2 would be the increased variety of vegetation.

Recreation

Recreation experiences would change in quality in the Sandy area. Refer to Alternative 1 for discussion of changes. The impacts shown on TABLE 8-29 are based upon the same allotments as in the proposed action. TABLE 8-30 shows visitor use under Alternative 2.

Removal of fencing under this alternative would reduce the hazard to snowmobiling, floatboating, and cross-country skiing. In an encounter with a fence, the potential danger to snowmobile operators is severe; to floatboaters, moderate to severe; and to cross-country skiers, slight. A potential hazard to recreation seekers from soil and waterborne disease related to wildlife would occur under this alternative. The reduction of hazard potential has not been quantified.

TABLE 8-27

HISTORIC TRAILS THAT WOULD BE IMPACTED BY THE PROPOSED FENCE UNDER ALTERNATIVE 2

Allotment	Trail
Steamboat Mountain	Point of Rocks - South Pass City Stage Road
Little Colorado	Bryan - South Pass City Stage Road
Little Colorado	Oregon Trail (two branches)

TABLE 8-28

FENCES THAT WOULD BE REMOVED UNDER ALTERNATIVE 2

Allotment	Location	Trail
Fish Creek	S. 10, T. 28 N., R. 101 W.	Lander Cutoff
Fish Creek	S. 11, T. 28 N., R. 101 W.	Lander Cutoff
Gold Creek	S. 34, T. 29 N., R. 102 W.	Lander Cutoff
Gold Creek	S. 2, T. 28 N., R. 102 W.	Lander Cutoff
Bar X	S. 5, T. 27 N., R. 100 W.	Oregon Trail
Bar X	S. 6, T. 27 N., R. 101 W.	Oregon Trail
Bar X	S. 4, T. 27 N., R. 101 W.	Oregon Trail
I-6	S. 15, T. 27 N., R. 102 W.	Oregon Trail
I-7	S. 1, T. 27 N., R. 102 W.	Oregon Trail
I-8	S. 7, T. 28 N., R. 100 W.	Lander Cutoff
I-22	S. 7, T. 26 N., R. 105 W.	Sublette Cutoff
I-25	S. 19, T. 29 N., R. 104 W.	Lander-Pinedale Stage Road
I-25	S. 13, T. 29 N., R. 105 W.	Lander-Pinedale Stage Road
I-28	S. 17, T. 30 N., R. 105 W.	Lander Cutoff

TABLE 8-29

PERCENT CHANGE IN VISITOR USE FROM EXISTING CONDITIONS UNDER ALTERNATIVE 2

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy-Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Change in Percent Use
Sand Dune Rally											0						0
Recreation Vehicle			+233	0	0		0	0	0	0	0	+100	+100			+233	+49
Camping Trailer	+25	+25	+25	+25	+100	+100		0	0	+25		0	+25	+100	+100	0	+25
Dry Camp Tent	-23	0	+6	-5		+80						+11	+5	0	0	0	+18
Tent Camping	+25	+27	+32	+25		+400			0			0	+32	+321	+5	0	+45
Picnic.Dry Camp	+38	0	+11	0							+10	+11				0	+8
Picnic	+33	+44	+43	+43					0			0		+150		0	+41
Camping.Camping Areas			+33			+900						0	+33	+900		0	+771
Picnic.Picnic Areas			+33			+900						0	+33	+900		0	+124
Hunting Moose	0	0	0						0			0	+100	+100	+100		+58
Elk	0	+10	0	0	+10			0				0	0	0	+12	+10	+2
Deer	0	0	+12	0	+12	+11	0	0	0	0	0	0	0	+17	+11	0	+9
Antelope	0	+20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grouse			+25	0					-4			+17	+33				+4
Sage Grouse	+31	+32	+47	+17	+56			0		+11		+32	+55			+25	+27
Dove			+20		+42					+12	+3			+75	+100	0	+17
Goose/Duck						+25								+72			+31
Cottontail						+59											+38
Rock Collecting	0			0	0	+100		0	0	0				0			+18
Fishing.Stream	+40	+53	+39	+39					+12			+11	+178	+147	+267	+12	+77
Floatboat/Canoe	+371	+155	+65	+11		+47			+300			+56	+83	+46	+482		+111
Fishing.Reservoir						+11								+11			+11
Boating						0								0			0
Waterskiing						+26								+25			+26
Swimming						0								0			0
Snow Play	0	0	0									0		0			0
Cross-Country Skiing			+5	0								-5					+3
Snowmobile			0			-10					-5	-10					-6
Sightseeing - Highway	0		0	0		0				0	0	0		0	0	+11	0
Sightseeing - General	+67	0	0	0	+11	+11	0	0	0	0	0	+25	+25	+11		0	+11
CHANGE IN TOTAL USE	+45	+54	+30	+19	+13	+287	0	0	+3	+6	0	+10	+54	+341	+149	+9	+109

TABLE 8-30

PROJECTED VISITOR DAYS PER YEAR UNDER ALTERNATIVE 2

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy-Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Total
Sand Dune Rally											3,700						3,700
Recreation Vehicle			1,200	803	278		805	68	35	233	248	630	1,426			50	5,776
Camping																	
Trailer	778	74	15,404	8,485	58	3,824		440	630	755		8,626	6,584	1,746	964	46	48,414
Dry Camp Tent	30	4	813	403		191						599	347	56	30	3	2,476
Tent Camping	145	14	3,041	1,591		1,595			7			1,617	1,300	691	379	9	10,389
Picnic.Dry Camp	11	2	50	60							74	31				2	230
Picnic	96	26	579	771					30			252		250		18	2,022
Camping.Camping Areas			1,600			58,340						100	933	78,750		100	139,823
Picnic.Picnic Areas			725			660						45	449	510		45	2,434
Hunting																	
Moose	1	1	1						1			1	6	4	4		19
Elk	1	22	438	39	22			37		12	7	90	167	4	46	33	918
Deer	2	3	67	132	37	224	10	62	9	19	17	79	191	7	82	4	945
Antelope	3	6	4	11	12	82	236	28	46	13	21	3	2	3	6	1	477
Grouse			10	2					44			7	8				71
Sage Grouse	36	28	750	2,966	75			95		360		1,607	931			5	6,853
Dove			6		17					46	33			7	4	2	115
Goose/Duck						410								81			491
Cottontail						279					146						425
Rock Collecting	355			412	14	700		225	273	231				48			2,258
Fishing.Stream	47	52	7,910	4,987					48			4,430	7,300	2,037	1834	38	28,683
Floatboat/Canoe	551	155	358	192		1,519			68			234	550	291	1264		5,182
Fishing.Reservoir						7,679								842			8,521
Boating						1,100								248			1,348
Waterskiing						78								128			206
Swimming						132								8			140
Snowplay	56	56	222									28				139	501
Cross-Country Skiing			108	2								19					129
Snowmobile			117			35					390	199					741
Sightseeing Highway	60		180	210		946				752	705	180		598	230	133	3,994
Sightseeing General	142	47	1,612	4,477	857	764	549	419	395	100	2,000	3,995	5,779	11,318		22	32,476
TOTAL USE BY ALLOTMENT	2,314	490	35,195	25,543	1,370	78,558	1,600	1,374	1,586	2,521	7,341	22,772	25,973	97,627	4843	650	309,757

Wilderness Resource

Potential impacts to the wilderness resource would result from the proposed checkerboard fence. Where these potential impacts exist, implementation of these components of the alternative would be postponed until the studies and public meetings required under the Federal Land Policy and Management Act (FLPMA) have been completed.

Livestock Grazing

Discontinuance of livestock grazing would result in a permanent loss of 138,047 AUMs of base property qualifications. For the permittees in the Sandy area, this would mean the loss of spring-fall and/or summer forage. The loss of this forage would ultimately cause a greater reduction in overall ranch operations than just the loss of this feed (Heady et al. 1974). It would cause some operators to adjust their year-round operations by reducing herd numbers and/or purchasing additional forage. Other operators could possibly not adjust their operations and would be forced out of the livestock business.

Approximately 60% of the 48 permittees could be eliminated from the livestock business. Twenty-four of the permittees who depend on the NRL for a majority of their year-round operations would not be able to reduce the size of their herds and continue to operate on their private and state land. Only 7% of the Sandy area is State and private land (MAP 1-2). Four operators could reduce their herd size and continue in the livestock business for a time, but they could not run enough livestock for their operations to be economical in the long term and eventually would be eliminated from the business.

Fourteen cattle permittees could adjust and remain in the livestock business. This amounts to 29% of the operators in the Sandy area. The adjustments could require a reduction in herd numbers, conversion of hayland to pasture, and/or the purchase of additional feed. Five sheep permittees, or 10% of the operators in the Sandy area, have their major operations outside the area. They currently make fall use of the Sandy area but could adjust their operations to make fall use in other areas by reducing their herd size.

The economic impact could be severe on those operators who would lose large numbers of AUMs or would be forced out of business. This impact is discussed in more detail in the socioeconomic analysis.

Farming

The discontinuance of livestock grazing on NRL would result in greater utilization of the private lands used for hay production. It would be expected that some hayland would be converted to pasture land, resulting in less hay produced. Approximately 20% of the acreage producing hay in the Sandy area is controlled by 16 of the 48 permittees on the Sandy area. The remaining 32 permittees have base properties outside the Sandy area, some of which is used for hay production.

Local consumption of the hay grown in the Eden Valley could increase if hayland would be converted to pasture land. Presently approximately 50% of the hay produced in the Eden Valley is sold elsewhere.

Socioeconomic Conditions

This alternative would have several major impacts to the ranchers of the Sandy area. There would be an immediate loss of 150,288 AUMs (private, State, and Federal) to livestock (TABLE 2-24), resulting in a loss of $3,182,348 of total income per year. In addition it is projected that 60% of the Sandy users would be forced out of business. This would result in the reduction of approximately 28 ranch proprietors and as many as 64 agricultural jobs. Income from maintenance by ranchers would also decline by $19,000 per year.

Recreation income would, however, increase by $563,885 per year (see recreation analysis and Chapter 3 socioeconomic conditions section).

There would also be $31,875 per year income for eight years from construction of the checkerboard fence and $11,400 income from fence removal projects.

The attitudes and expectations of the Sandy permittees would undoubtedly be hostile to this alternative in that their means of livelihood would be removed or severely reduced in many cases. On the other hand, those who favor the open spaces and increased wildlife in the area would be extremely satisfied as livestock and most fences would be removed from the Sandy area.

See APPENDIX 3E and Chapter 3 socioeconomic conditions section for methodologies used in this analysis.

ALTERNATIVE 3-ALLOW CONVERSIONS WITHOUT FENCING

DESCRIPTION

Under this alternative, the existing allotment and individual use pastures would be retained the same as Alternative 1. Operators would be allowed to convert present sheep use to cattle use as stated in the proposed action. Allotments, individual use pastures, and range improvements are shown on MAP 8-3 located at the end of this chapter. The proposed livestock management for this alternative is shown in TABLE 8-31.

Grazing systems, class of stock, season of use, and wildlife and wild horse reservations by allotment are shown on TABLE 8-32. Wildlife and wild horse competitive reservations differ from the proposed action as shown in TABLE 8-32 for the Steamboat Mountain, Red Desert, Bush Rim, Continental Peak, Pacific Creek, and Sands Allotments because the allotment boundaries are different. The total competitive reservations and total forage provided for wildlife and wild horses within the Sandy area are the same for this alternative as for the proposed action except for the adjustments made for the

TABLE 8-31

PROPOSED LIVESTOCK MANAGEMENT UNDER ALTERNATIVE 3

	Acres	Total Livestock AUMs	Number of Areas
Allotment Management	1,957,604	122,676*	18
Custodial Management	39,726	2,290**	34
No Grazing	970	0	1
Federal Withdrawals	1,750	0	3
	2,000,050	124,966	56

* Includes Federal, State and private AUMs (See TABLE 8-32).

** Federal AUMs only.

Buckskin-Sandy and Sandy (I-28) individual use pastures (TABLE 8-32).

Four treatments are used in various combinations to make up the three different grazing systems proposed for this alternative (TABLE 8-33). The two pasture and three-pasture deferred systems are described in Chapter 1. The season-long grazing system is described under Alternative 1. There would be no change in the management of individual use pastures. Class of stock, season of use, and AUMs for individual use pastures are the same as Alternative 1 (TABLE 8-4).

Existing fences as shown on MAP 8-3 would remain. Proposed fences are limited to the southern boundary (checkerboard boundary) fence shown on the same map. Water developments would be the same as the proposed action; however, fencing of waters would be limited to springs. No existing waters would be fenced. Since the Buckskin-Sandy and I-28 pastures would remain as individual use pastures under this alternative, the two earthfill reservoirs proposed for this area in Chapter 1 (see MAP 1-5) would not be constructed.

Livestock use in unfenced allotments would be controlled by herding. Herding of livestock would be the responsibility of the operator. Analysis of this alternative assumes that herding would be used to accomplish the following:

1. Control of livestock within the prescribed season and area of use.
2. Distribution of livestock among water developments.
3. Assure compliance with trailing requirements.
4. Removal of trespass livestock from adjacent allotments.

Range supervision for this alternative would involve BLM employees making routine allotment inspections to ensure compliance with the above items. Administrative actions related to unauthorized use (trespass) would be taken in accordance with BLM Manual 9230. Because there would be no fencing of allotment boundaries, standard BLM allotment boundary signs mounted on gray fence posts would be located as shown on MAP 8-3 at sites where they are easily visible.

ANALYSIS OF ALTERNATIVE 3 IMPACTS

Impacts on the existing environment's resources and land uses that would or could occur as a result of implementation of this alternative are analyzed in two stages: short term (eleven years following completion of this statement, or 1988) and long term (23 years following completion of this statement, or 2000). The analysis follows the same general pattern used to analyze the proposed action.

Soils

Sheet Erosion

Anticipated decreases in ground cover from implementation of this alternative (see vegetation analysis) would increase the estimated sheet erosion rate in the Sandy area by 494,817 tons per year to a total of approximately 8,873,427 tons per year in 23 years (TABLE 8-34). Long-term increases would vary in the proposed allotments, depending upon the soil associations present. A detailed analysis of soil association erosion by pasture is available for review upon request from the Rock Springs District Office. In allotments under existing AMPs (Bar X, Fish Creek, and Gold Creek Allotments), total ground cover would increase with corresponding decreases in sheet erosion.

The Musgrave Equation was used to compare the changes in sheet erosion rates. These calculations depend largely upon the projected long-term increases in litter accumulation and canopy cover (TABLE 8-42) which were used to adjust the ground cover factor in the equation. APPENDIX 2B outlines how these calculations were made.

Mapping Units 132, 233, and 333 would continue to erode at high rates. Approximately 88,630 acres of these soils are found in the Steamboat Mountain, Bush Rim, Continental Peak, and Pacific Creek Allotments. A detailed analysis by soil association in each pasture is available for review upon request from the Rock Springs District Office.

The large decreases in total ground cover over mapping units with sagebrush-grass vegetation type (vegetation analysis TABLE 8-42) on slopes of 4 to 14% would be expected to cause the greatest increases in sheet erosion. Marked increases in sheet erosion would be anticipated on 1,021,056 acres (51% of the Sandy area) in the Little Colorado, Red Desert, Bush Rim, Continental Peak, Pacific Creek, White Acorn, and Pine Creek Allotments.

Large increases in total ground cover would be anticipated on mapping units with sagebrush-grass vegetation in allotments with existing AMPs: the Bar X, Fish Creek, and Gold Creek Allotments. Sheet erosion would be reduced on an estimated 22,098 acres, or 49% of the above allotments.

Large decreases in total ground cover on meadow soils (Mapping Units 210 and 310) and saltbush-winterfat soils (111, 117, and 126) would increase sheet erosion very little due to the nearly level surface where these soils occur. The same would occur for the grass vegetation soil (211). Very little change in sheet erosion rates would be anticipated on soils in forested areas, mountain slopes, and sand dune areas due to little change in total ground cover. Exact amounts of reductions are available for review upon request from the Rock Springs District Office.

The guidelines for acceptable average erosion (Soil Conservation Service 1973) were used to determine the acres of erosion by class under this alternative. The excessive erosion category would increase by 12,731 acres to 432,365 acres. Moderate sheet erosion would occur on 1,480,582 acres, or 62,817 acres more than existing conditions. The increase in acres in excessive and moderate

TABLE 8-32

PROPOSED MANAGEMENT AND USE LEVELS BY ALLOTMENT UNDER ALTERNATIVE 3

Allotment And Acres	Grazing System	Proposed Livestock Use in AUMs[1/]: Class of Livestock	Season of Use	Federal Land Use: Livestock	Federal Land Use: Trailing Use	State & Private Land Use[2/]	Total Livestock Use	Wildlife[3/]: Compet. Reserv. In AUMs[1/]	Wildlife[3/]: Total Allow. In AUMs[1/]	Wild Horses[3/]: Compet. Reserv. In AUMs[1/]	Wild Horses[3/]: Total Allow. In AUMs[1/]	Total Forage Use 4/ Area In AUMs[1/]
1. Bar X 6,895	Deferred 3-Pasture	Cattle	06/01-10/15	355		437	792					
		Sheep	06/01-10/15	32		38	70					
		Horses	06/01-10/15	7		10	17					
		TOTALS		394	None	485	879	74	519	None	None	1,398
2. Fish Creek 7,237	Deferred 2-Pasture	Cattle	05/16-08/15	657		231	888					
		TOTALS		657	None	231	888	6	55	None	None	943
3. Gold Creek* 24,580	Deferred 3-Pasture Grazing	Cattle	06/01-10/31	2,137		686	2,823					
		TOTALS		2,137	None	686	2,823	217	971	None	None	3,794
3a. Willow Creek* 5,945	Season Long Grazing	Cattle	06/01-10/31	555		143	698					
		TOTALS		555	None	143	698	58	258			956
4. Little Sandy* 114,879	Season Long Grazing	Cattle	05/16-10/31	6,097	326	1,295	7,718					
		TOTALS		6,097	326	1,295	7,718	877	7,175	None	None	14,893
4a. Little Prospect* 70,781	Season Long Grazing	Cattle	05/16-10/31	1,982			1,982	237				
		Sheep	05/10-10/05	3,117	102		3,219	282				
		TOTALS		5,099	102	0	5,201	519	1,942	None	None	7,143
5. Steamboat Mountain 38,276	Season Long Grazing	Cattle	05/01-12/15	1,301		199	1,500					
		Sheep	Spring		80		80					
		Sheep	Fall		20		20					
		TOTALS		1,301	100	199	1,600	429	1,344	None	None	2,944
6. Little Colorado* 726,956	Season Long Grazing	Cattle	05/01-01/31			128	128					
		Cattle	05/01-06/30									
		Cattle	05/16-10/31	16,590	On Demand		16,590					
		Sheep	05/01-11/30			650	650					
		Sheep	05/01-12/15	26,027	On Demand		26,027					
		Sheep	06/01-12/15									
		TOTALS		42,617		778	43,395	671	3,279	486	1,800	48,474
7. Red Desert* 252,229	Season Long Grazing	Cattle	05/01-12/15	8,786		923	9,709					
		Sheep	11/01-12/15	5,219		415	5,634					
		Dual			146		146					
		TOTALS		14,005	146	1,338	15,489	203	1,067	2,081	5,277	21,833
8. Bush Rim* 100,437	Season Long Grazing	Cattle	05/01-12/15	2,070		102	2,172					
		Sheep	07/10-12/15	2,384		90	2,474					
		Sheep			276		276					
		TOTALS		4,454	276	192	4,922	461	1,988	504	1,340	8,250
9. Continental Peak* 89,914	Season Long Grazing	Cattle	05/01-12/15	1,323		200	1,523					
		Sheep	05/01-07/15	4,682		540	5,222					
		Sheep	07/16-10/15									
		Sheep	10/16-12/15									
		Dual			58		58					
		TOTALS		6,005	58	740	6,803	212	998	377	1,183	8,984
10. Pacific Creek* 203,738	Season Long Grazing	Cattle	05/01-12/15	4,208		499	4,707					
		Sheep	05/15-10/31	6,375		563	6,938					
		Sheep			240		240					
		TOTALS		10,583	240	1,062	11,885	1,085	5,040	None	None	16,925
11. Sands* 112,051	Season Long Grazing	Cattle	05/01-12/15	3,262		75	3,337					
		Sheep	11/01-12/15	735		13	748					
		Dual			100		100					
		TOTALS		3,997	100	88	4,185	550	2,304	None	None	6,489
12. White Acorn* 46,794	Season Long Grazing	Cattle	06/01-10/15	2,286		782	3,068					
		Sheep	05/16-10/31	1,460		500	1,960					
		Sheep			349		349					
		Cattle			7		7					
		TOTALS		3,746	356	1,282	5,384	217	1,279	None	None	6,663

TABLE 8-32 (Continued)

PROPOSED MANAGEMENT AND USE LEVELS BY ALLOTMENT UNDER ALTERNATIVE 3

Allotment And Acres	Grazing System	Proposed Livestock Use in AUMs 1/: Class of Livestock	Season of Use	Livestock	Trailing Use	State & Private Land Use 2/	Total Livestock Use	Wildlife 3/: Compet. Reserv. In AUMs 1/	Wildlife 3/: Total Allow In AUMs 1/	Wild Horses 3/: Compet. Reserv. In AUMs 1/	Wild Horses 3/: Total Allow. In AUMs 1/	Total Forage Use 4/ Area In AUMs 1/
13. Prospect Mountain 56,623	Season Long Grazing	Cattle	05/16-10/31	1,744		340	2,084					
		Sheep	05/16-09/10	1,151		193	1,334					
		Cattle	Spring		6		6					
			Fall		5		5					
		Sheep	Spring		127		127					
			Fall		80		80					
		TOTALS		2,895	218	523	3,636	81	2,947	None	None	6,583
14. Reservoir 35,545	Season Long Grazing	Cattle	10/16-10/31	80		20	100					
		Sheep	05/05-10/31	1,669		469	2,138					
		Horses	05/16-10/31	94		26	120					
		TOTALS		1,843	None	515	2,358	74	563	None	None	2,921
15. Poston* 50,635	Season Long Grazing	Cattle	05/16-06/30	300		81	381					
		Cattle	07/01-10/11	242			242					
		Sheep	05/05-07/10	979		440	1,419					
		Sheep	09/10-12/15	1,909			1,909					
		Horses	05/16-10/31	98			114					
		Dual			84	16	84					
		TOTALS		3,528	84	537	4,149	124	1,047	None	None	5,196
16. Pine Creek* 14,089	Season Long Grazing	Cattle	07/01-10/31	732		103	835					
		Sheep	07/01-09/07	184		26	210					
		Horses	04/16-12/31	69		10	79					
		TOTALS		985	None	139	1,124	15	140	None	None	1,264
TOTAL 5/ 1,957,604				110,898	2,006	10,233	123,137	5,873	32,916	3,448	9,600	165,653

*Indicates an operator's desire to convert from a previously adjudicated class of livestock to that class as shown to a class of livestock from that adjudicated.

1/ An AUM is the amount of forage 1 cow, 5 sheep, 14.6 pronghorn, 5 deer, 1.5 elk, 1 moose, or 1 horse would eat in 1 month.

2/ This includes the state and private land AUMs that would be available as exchange of use (see Glossary).

3/ Competitive reservations are the portions of the livestock diets that overlap with those of wildlife and wild horse diets and which are needed to assure proper amounts of forage would be available for the numbers of wild animals expected in each allotment. Total allowance is the sum of these reservations and the additional forage available that wildlife and/or wild horses would use, but livestock would not use. Wild horse allowances represent enough forage for 800 animals for one year (800 X 12 = 9,600 AUMs), or the number of horses that are recommended for the area in the BLM's draft wild horse unit management plans. Wildlife allowances are based on the number of months each species would be expected in each allotment; numbers of animals are estimated from population data provided by the Wyoming Game and Fish Department at the time the AMPs were developed.

4/ Total forage use is the sum of the total livestock use and the total allowances for wildlife and wild horses.

5/ 11,361 acres of the Buckskin-Sandy and Sandy (I-28) individual use pastures are not included in the Prospect Mountain Allotment for this alternative, See TABLE 8-8.

TABLE 8-33

PROPOSED GRAZING SYSTEMS UNDER ALTERNATIVE 3

System	Number of Allotments	Acres
Two-Pasture Deferred Grazing	1	7,237
Three-Pasture Deferred Grazing	2*	31,475
Season Long Grazing	15**	1,918,892
TOTALS	18	1,957,604

* The Gold Creek Allotment is divided into two allotments: the Gold Creek portion utilizing a three-pasture deferred system and the Willow Creek portion utilizing season-long grazing.

** The Little Sandy-Little Prospect Allotment is divided into two allotments: the Little Sandy and the Little Prospect, both utilizing season-long grazing.

TABLE 8-34

LONG-TERM SHEET EROSION UNDER ALTERNATIVE 3

Allotment Pasture	Acres	Geologic Erosion Tons/Year	Other Sheet Erosion Tons/Year	Total Erosion Tons/Year
1. Bar X				
1	2,124	1,950	1,278	3,228
2	2,543	2,334	743	3,077
3	2,228	2,143	308	2,451
Total	6,895	6,427	2,329	8,756
2. Fish Creek				
1	3,389	3,111	2,480	5,591
2	3,848	3,532	3,048	6,580
Total	7,237	6,643	5,528	12,171
3. Gold Creek				
1	4,662	4,280	3,506	7,786
2	10,591	9,723	9,235	18,958
3	9,327	8,562	6,828	15,390
Total	24,580	22,565	19,569	42,134
3a. Willow Creek	5,945	5,458	5,124	10,582
4. Little Sandy	114,879	105,459	314,998	420,457
4a. Little Prospect	70,781	64,977	160,814	225,791
5. Steamboat Mountain	38,276	35,137	625,890	661,027
6. Little Colorado	726,956	667,346	1,993,313	2,660,659
7. Red Desert	252,229	231,546	482,262	713,808
8. Bush Rim	100,437	92,201	808,719	900,920
9. Continental Peak	89,914	82,541	633,174	715,715
10. Pacific Creek	203,738	187,029	1,061,867	1,248,896
11. Sands	112,051	102,863	408,090	510,953
12. White Acorn	46,794	42,957	155,450	198,407
13. Prospect Mountain	56,623	51,980	146,767	198,747
14. Reservoir	35,545	32,630	72,228	104,858
15. Poston	50,635	46,483	151,500	197,983
16. Pine Creek	14,089	12,934	28,629	41,563
Total	1,957,604	1,797,176	7,076,251	8,873,427

sheet erosion would be reflected in the reduction of 85,676 acres in the light category (TABLE 8-35).

Reservoirs and watering troughs are areas that would receive increased use. Animals would trample the vegetation and compact the soil around these areas. Construction at these sites would also cause large areas of bare ground. Runoff from these areas would significantly reduce the life expectancy of reservoirs and pits if left unfenced and unmaintained (Chapter 3 soils section). Sediment contributed by sheet erosion to reservoirs and pits would only be reduced by 10 tons per acre per year to 612 tons per acre per year. Sheet erosion would still continue to reduce water quality and impair aquatic habitat.

Wind Erosion

The impacts would be the same as discussed under Alternative 1.

Compaction

The relative degree of use by livestock in the short and long terms under Alternative 3 was estimated using a technique similar to that used in APPENDIX 2D for the current relative degree of use. TABLE 8-36 shows acres effectively used by livestock (acres in the light, moderate, heavy, and severe intensity classes) would increase under this alternative from 918,463 acres presently (TABLE 2-6) to 1,108,050 acres in the short term and 1,088,747 acres in the long term. This increased acreage is largely a result of the increased available water that would be supplied by this alternative. While increased available water would result in more even grazing throughout the pastures, the season-long grazing system of most allotments would cause the 63,334 acres of soil in the severe and heavy intensity of use categories to receive season-long compaction each year over the short term. This would cause a reduction in infiltration rates, increased runoff and erosion, and lost soil productivity.

Livestock grazing intensity in the Bar X, Fish Creek, Gold Creek, Willow Creek, and Prospect Mountain Allotments would increase over the long term due to increases in AUMs used (TABLE 8-43). Grazing intensity in the Little Prospect, Little Colorado, Red Desert, Bush Rim, Pacific Creek, and White Acorn Allotments would decrease. Grazing intensity would remain unchanged in the Little Sandy, Steamboat Mountain, Continental Peak, Sands, Reservoir, Poston, and Pine Creek Allotments. There would be a total decrease of 9,342 AUMs used in the Sandy area, which would result in a corresponding decrease in grazing intensity. Acres in the heavy and severe intensity classes would be reduced over the long term by 10,818 acres in allotments where soil compaction would be expected to occur (TABLES 2-6 and 8-36). Severe and heavy intensity classes would total 52,516 acres in the long term.

Water Resources

Water Use

Water consumption by livestock under this alternative would be 107 acre-feet per year at the end of the twenty-third year and 115 acre-feet per year during the first eleven years (TABLE 8-37). This would be an increase of 43 acre-feet per year in the short term and 35 acre-feet per year in the long term above existing water use levels (TABLE 2-7). This increase in consumptive use by livestock is due to a proposed increase in active AUMs over the present actual use (TABLE 1-1). The decrease in the long term would be due to a decrease in production (TABLE 8-43) and corresponding reduction in livestock numbers.

Evaporation losses would increase 407 acre-feet per year in 23 years because of the proposed 94 reservoirs and pits (TABLE 8-38). Total evaporation loss from reservoirs in the Sandy area would be 1,283 acre-feet per year in the long term.

Streamflow

Alternative 3 would have an unmeasurable effect on streamflow in perennial streams within or downstream from the Sandy area. Refer to Alternative 1 for analysis of streamflow.

Storm runoff from a ten-year event would increase 24% above existing levels in the Sandy area at the end of 23 years and 1% at the end of eleven years (TABLE 8-39). This increase is due to decreased infiltration rates under season-long grazing and a projected long-term decrease in vegetation cover (see vegetation analysis). Runoff was calculated using model basins as explained in Alternative 1.

Ten-year storm runoff from the Bar X, Fish Creek, Little Sandy, Little Prospect, Steamboat Mountain, Prospect Mountain, and Reservoir Allotments would decrease below existing levels due to the decrease in acres in the severe, heavy, moderate, and light intensity of use classes (TABLE 8-36, soils analysis), and it would remain below existing levels at the end of 23 years (TABLE 8-39).

Runoff around the proposed water developments would increase above existing levels. These areas are presently receiving little grazing use by livestock. Grazing intensity decreases as the distance from water increases (Mueggler 1965). Infiltration rates decrease as intensity of livestock use increases (Gifford and Hawkins 1976).

Water Quality

This alternative would have no measurable effect on water quality in perennial streams within the Sandy area or downstream. Perennial streamflow would not be expected to change, and sediment transport would remain unchanged in these streams.

Sediment yield in the intermittent streams in the Sandy area would increase proportionally to the increase in

TABLE 8-35

ACREAGES OF EROSION CLASSES BY ALLOTMENT UNDER ALTERNATIVE 3

Allotment	Light[1/]	Moderate[2/]	Excessive[3/]
Bar X	6,895		
Fish Creek	7,237		
Gold Creek	24,580		
Willow Creek	5,945		
Little Sandy		114,879	
Little Prospect		70,781	
Steamboat Mountain			38,276
Little Colorado		726,956	
Red Desert		252,229	
Bush Rim			100,437
Continental Peak			89,914
Pacific Creek			203,738
Sands		112,051	
White Acorn		46,794	
Prospect Mountain		56,623	
Reservoir		35,545	
Poston		50,635	
Pine Creek		14,089	
TOTAL	44,657	1,480,582	432,365

1/Light - less than 2 tons per acre per year
2/Moderate - 2 to 5 tons per acre per year
3/Excessive - greater than 5 tons per acre per year

13,700 animals over the long term. This increase in mule deer would be due to removal of livestock and fences from the range, eliminating livestock competition and death loss to fence entanglement.

Food. Vegetation types used by deer would not be expected to change in size with implementation of this alternative. The condition of the range should improve in those areas showing poor to fair condition to good condition in the long term. Forage production over the total Sandy area for mule deer would be expected to increase to at least the levels indicated for long-term production (TABLE 8-26) found in the vegetation analysis. Analysis of forage availability on the crucial winter habitat indicates that forage requirements for the wintering populations within each allotment where this habitat occurs (MAP 2-23) would be adequately satisfied.

Cover. Based on the analysis of food adequacy for mule deer on the Sandy area and the habitat types showing improvement in condition, cover requirements should be adequate within the Sandy area. The proposed three-wire checkerboard boundary fence could reduce mule deer mobility should they be required to migrate farther south than normal into the checkerboard lands during severe winters to obtain adequate cover for survival (MAP 2-23).

Space. The space factor and mobility should be improved from implementation of this alternative when considering that fences on NRL would be removed. The checkerboard boundary fence would cause impacts on space for animals crossing back and forth either on a daily basis or when movement would be necessary farther south than the Sandy area due to adverse weather conditions.

Migration. Migration patterns of mule deer are very isolated and involve less than 50% of the Sandy area. These patterns should not be altered by implementation of this alternative. The only exception would be where migration routes cross the proposed checkerboard boundary fence (MAP 2-23).

Elk. Under this alternative elk would be expected to increase by 165 to 200% above present numbers (Chapter 2) to as many as 3,500 animals.

Food. Vegetation types used by elk would not be expected to change in size to any significant degree with implementation of this alternative, but the condition of the range should improve in those areas showing poor to fair condition to good condition in the long term. Forage production for elk over the total Sandy area would be expected to increase to at least the levels indicated for long-term production predicted in TABLE 8-26. Analysis of forage availability on the crucial winter habitat (MAP 2-24) indicates that forage requirements would be adequately satisfied.

Cover. Based on the analysis of food adequacy for elk on the Sandy area and the habitat types showing improvement in condition, cover requirements should be adequate within the Sandy area. Access to a portion of the crucial winter range for necessary cover could be somewhat impaired during severe weather conditions due to the proposed checkerboard boundary fence. Elk losses attributable to this fence would be minor except during extreme weather conditions such as heavily crusted and deep snow. These conditions would contribute greatly to a weakened condition of the elk, which could cause the elk to have difficulty negotiating the fence.

Space. Space should improve following implementation of this alternative because fences on NRL would be removed. Impacts to elk as a result of the three-wire checkerboard boundary fence are described in the cover analysis above.

Migration. The migration of elk which summer in the Oregon Buttes and Continental Peak areas would occur across the checkerboard boundary, and the identified impacts on elk from the proposed fence would be long term in nature. The elk in the Prospect Mountain area as identified in Chapter 2 would not be impacted during migration due to the proposed removal of all fences on NRL.

Moose. Implementation of this alternative would cause the moose population to increase 165 to 350% above current levels, reaching as many as 270 animals.

Food. Implementation of this alternative would not cause a change in size of any of the vegetation types pertinent to moose habitat; the livestock use would be eliminated, thus allowing it to steadily improve in quality over the long term. Plant composition should change considerably on the meadow types where invader shrubs and forbs are common as a result of past heavy use. Willow availability would be expected to improve over the long term. Total production for moose would also be expected to improve over the long term (TABLE 8-26). Range condition for moose should improve to a good rating over the Sandy area in the long term.

Analysis of forage availability on the crucial winter habitat indicates that forage requirements for the moose population would be adequate in all allotments.

Cover. Cover requirements for moose should be adequately provided as vegetation conditions steadily improve.

Water. Water requirements should be adequate as moose habitat is generally associated with wet meadow areas.

Space and Migration. These requirements should be improved since all fences on NRL would be removed.

Sage Grouse. This alternative could cause an increase of 5 to 20% in the short term. Over the long term, current populations could increase by as much as 30%.

Food and Cover. The range condition of sage grouse habitat should improve. Based on the food and cover analysis of the other game species, adequate forage and cover should be available for sage grouse to maintain themselves.

Space. The adequacy of this requirement should improve from the present situation because livestock would be removed.

Waterfowl. Current populations of ducks would be expected to increase by 30% over the long term because of elimination of livestock trampling (Gjersing and Mundinger 1975).

Food and Cover. These factors should improve under this alternative because foraging by livestock along

streams and ponds would be eliminated. Removal of livestock would eliminate trampling of nesting grounds.

Space and Migration. This element should improve over the present situation just from the removal of livestock.

Threatened or Endangered Species. Animal species considered to be threatened or endangered common to the Sandy area are peregrine falcons and black-footed ferrets. Both species are dependent upon the populations of nongame species as a food source and are impacted by the fluctuation in those population levels. The nongame population levels would be expected to increase by 10 to 30%; therefore, the possibility of these two species to increase in number would be greatly improved.

Range Improvements. All existing fences on NRL within the Sandy area would be removed; thus fence-related injuries and barrier problems during severe weather conditions would be eliminated.

Aquatic

Alternative 2 would result in an immediate recovery of depressed areas over the short term. In the long-term a 10 to 20% improvement of stream habitat would occur in association with those channel stability improvement potentials noted in the water resources analysis (TABLE 8-23). Over the short term, the most immediate improvement of aquatic habitat would be related to bank stabilization by grasses, forbs, and willows, reducing sedimentation.

Long-term changes would be more closely associated with improved deep-rooted bank stabilization and shading by willows which would, in turn, improve both riffle and pool habitat quality. However, Platts noted in his Bear Valley Creek, Idaho, studies (1972) that as much as 33% bank damage may still occur on streams in rested areas which receive trailing use. If trailing use through the Sandy area would be limited to upland areas, the associated site-specific impacts could be greatly reduced or eliminated. A 50 to 70% improvement of aquatic habitat productivity and fish populations could also be anticipated as a long-term impact.

Wild Horses

This alternative would provide a surplus of forage for the number of horses proposed in the wild horse management plans. The competition between wildlife and wild horses should be insignificant because the horse numbers proposed would require only 9,600 AUMs.

The elimination of livestock and removal of fences would be conducive to the free roaming nature of wild horses. The only limiting factors on movement and location of wild horses would be water, fences around the private and State land, and the checkerboard boundary fence. The wild horses could change some of their present areas of use if water would be made available.

CulturalResources

Under this alternative damage to archeological and historical sites from direct trampling and sheet erosion caused by trampling would be eliminated because livestock would be removed from the Sandy area. Trailing could have a slightly adverse impact, as the animals would trample any sites they would go through, causing breakage of artifacts as well as displacement from their location. This impact would be slight for any single time a herd would move across a site; however, if the same trails are used year after year, the cumulative effect could be severe.

In locations where historic trail remains have not been seriously altered, the construction of a fence would cause a severe visual impact which would lessen the experience of individuals visiting these locations. The construction of the checkerboard boundary fence would affect the trails in TABLE 8-27 in the manner described above.

The removal of fences where they are currently in place would enhance the experience of individuals traveling the trails (TABLE 8-28). In addition, the removal of these fences would increase the chances of at least three historic and prehistoric sites being eligible for inclusion on the National Register of Historic Places as visual impediments would be removed (TABLE 2-63).

Visual Resources

In terms of visual contrast and contrast rating, Alternative 2 would be virtually identical to the existing contrast shown on TABLE 2-65. This is because the visual contrasts in the Sandy area are primarily due to such manmade disturbances as roads and trails, powerlines, oil wells, and similar developments. The real impact of Alternative 2 would be the increased variety of vegetation.

Recreation

Recreation experiences would change in quality in the Sandy area. Refer to Alternative 1 for discussion of changes. The impacts shown on TABLE 8-29 are based upon the same allotments as in the proposed action. TABLE 8-30 shows visitor use under Alternative 2.

Removal of fencing under this alternative would reduce the hazard to snowmobiling, floatboating, and cross-country skiing. In an encounter with a fence, the potential danger to snowmobile operators is severe; to floatboaters, moderate to severe; and to cross-country skiers, slight. A potential hazard to recreation seekers from soil and waterborne disease related to wildlife would occur under this alternative. The reduction of hazard potential has not been quantified.

TABLE 8-27

HISTORIC TRAILS THAT WOULD BE IMPACTED BY THE PROPOSED FENCE UNDER ALTERNATIVE 2

Allotment	Trail
Steamboat Mountain	Point of Rocks - South Pass City Stage Road
Little Colorado	Bryan - South Pass City Stage Road
Little Colorado	Oregon Trail (two branches)

TABLE 8-28

FENCES THAT WOULD BE REMOVED UNDER ALTERNATIVE 2

Allotment	Location	Trail
Fish Creek	S. 10, T. 28 N., R. 101 W.	Lander Cutoff
Fish Creek	S. 11, T. 28 N., R. 101 W.	Lander Cutoff
Gold Creek	S. 34, T. 29 N., R. 102 W.	Lander Cutoff
Gold Creek	S. 2, T. 28 N., R. 102 W.	Lander Cutoff
Bar X	S. 5, T. 27 N., R. 100 W.	Oregon Trail
Bar X	S. 6, T. 27 N., R. 101 W.	Oregon Trail
Bar X	S. 4, T. 27 N., R. 101 W.	Oregon Trail
I-6	S. 15, T. 27 N., R. 102 W.	Oregon Trail
I-7	S. 1, T. 27 N., R. 102 W.	Oregon Trail
I-8	S. 7, T. 28 N., R. 100 W.	Lander Cutoff
I-22	S. 7, T. 26 N., R. 105 W.	Sublette Cutoff
I-25	S. 19, T. 29 N., R. 104 W.	Lander-Pinedale Stage Road
I-25	S. 13, T. 29 N., R. 105 W.	Lander-Pinedale Stage Road
I-28	S. 17, T. 30 N., R. 105 W.	Lander Cutoff

TABLE 8-29

PERCENT CHANGE IN VISITOR USE FROM EXISTING CONDITIONS UNDER ALTERNATIVE 2

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy-Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Change in Percent Use
Sand Dune Rally											0						0
Recreation Vehicle			+233	0	0		0	0	0	0	0	+100	+100			+233	+49
Camping Trailer	+25	+25	+25	+25	+100	+100		0	0	+25		0	+25	+100	+100	0	+25
Dry Camp Tent	-23	0	+6	-5		+80						+11	+5	0	0	0	+18
Tent Camping	+25	+27	+32	+25		+400			0			0	+32	+321	+5	0	+45
Picnic.Dry Camp	+38	0	+11	0							+10	+11				0	+8
Picnic	+33	+44	+43	+43					0			0		+150		0	+41
Camping.Camping Areas			+33			+900						0	+33	+900		0	+771
Picnic.Picnic Areas			+33			+900						0	+33	+900		0	+124
Hunting Moose	0	0	0						0			0	+100	+100	+100		+58
Elk	0	+10	0	0	+10			0				0	0	0	+12	+10	+2
Deer	0	0	+12	0	+12	+11	0	0	0	0	0	0	0	+17	+11	0	+9
Antelope	0	+20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grouse			+25	0					-4			+17	+33				+4
Sage Grouse	+31	+32	+47	+17	+56			0		+11		+32	+55			+25	+27
Dove			+20		+42					+12	+3			+75	+100	0	+17
Goose/Duck						+25								+72			+31
Cottontail						+59											+38
Rock Collecting	0			0	0	+100		0	0	0				0			+18
Fishing.Stream	+40	+53	+39	+39					+12			+11	+178	+147	+267	+12	+77
Floatboat/Canoe	+371	+155	+65	+11		+47			+300			+56	+83	+46	+482		+111
Fishing.Reservoir						+11								+11			+11
Boating						0								0			0
Waterskiing						+26								+25			+26
Swimming						0								0			0
Snow Play	0	0	0									0		0			0
Cross-Country Skiing			+5	0								-5					+3
Snowmobile			0			-10					-5	-10					-6
Sightseeing - Highway	0		0	0		0				0	0	0		0	0	+11	0
Sightseeing - General	+67	0	0	0	+11	+11	0	0	0	0	0	+25	+25	+11		0	+11
CHANGE IN TOTAL USE	+45	+54	+30	+19	+13	+287	0	0	+3	+8	0	+10	+54	+341	+149	+9	+109

TABLE 8-30

PROJECTED VISITOR DAYS PER YEAR UNDER ALTERNATIVE 2

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy-Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Total
Sand Dune Rally											3,700						3,700
Recreation Vehicle			1,200	803	278		805	68	35	233	248	630	1,426			50	5,776
Camping																	
Trailer	778	74	15,404	8,485	58	3,824		440	630	755		8,626	6,584	1,746	964	46	48,414
Dry Camp Tent	30	4	813	403		191						599	347	56	30	3	2,476
Tent Camping	145	14	3,041	1,591		1,595			7			1,617	1,300	691	379	9	10,389
Picnic.Dry Camp	11	2	50	60							74	31				2	230
Picnic	96	26	579	771					30			252		250		18	2,022
Camping.Camping Areas			1,600			58,340						100	933	78,750		100	139,823
Picnic.Picnic Areas			725			660						45	449	510		45	2,434
Hunting																	
Moose	1	1	1						1			1	6	4	4		19
Elk	1	22	438	39	22			37		12	7	90	167	4	46	33	918
Deer	2	3	67	132	37	224	10	62	9	19	17	79	191	7	82	4	945
Antelope	3	6	4	11	12	82	236	28	46	13	21	3	2	3	6	1	477
Grouse			10	2					44			7	8				71
Sage Grouse	36	28	750	2,966	75			95		360		1,607	931			5	6,853
Dove			6		17					46	33			7	4	2	115
Goose/Duck						410								81			491
Cottontail						279					146						425
Rock Collecting	355			412	14	700		225	273	231				48			2,258
Fishing.Stream	47	52	7,910	4,987					48			4,430	7,300	2,037	1834	38	28,683
Floatboat/Canoe	551	155	358	192		1,519			68			234	550	291	1264		5,182
Fishing.Reservoir						7,679								842			8,521
Boating						1,100								248			1,348
Waterskiing						78								128			206
Swimming						132								8			140
Snowplay	56	56	222									28				139	501
Cross-Country Skiing			108	2								19					129
Snowmobile			117			35					390	199					741
Sightseeing Highway	60		180	210		946				752	705	180		598	230	133	3,994
Sightseeing General	142	47	1,612	4,477	857	764	549	419	395	100	2,000	3,995	5,779	11,318		22	32,476
TOTAL USE BY ALLOTMENT	2,314	490	35,195	25,543	1,370	78,558	1,600	1,374	1,586	2,521	7,341	22,772	25,973	97,627	4843	650	309,757

Wilderness Resource

Potential impacts to the wilderness resource would result from the proposed checkerboard fence. Where these potential impacts exist, implementation of these components of the alternative would be postponed until the studies and public meetings required under the Federal Land Policy and Management Act (FLPMA) have been completed.

Livestock Grazing

Discontinuance of livestock grazing would result in a permanent loss of 138,047 AUMs of base property qualifications. For the permittees in the Sandy area, this would mean the loss of spring-fall and/or summer forage. The loss of this forage would ultimately cause a greater reduction in overall ranch operations than just the loss of this feed (Heady et al. 1974). It would cause some operators to adjust their year-round operations by reducing herd numbers and/or purchasing additional forage. Other operators could possibly not adjust their operations and would be forced out of the livestock business.

Approximately 60% of the 48 permittees could be eliminated from the livestock business. Twenty-four of the permittees who depend on the NRL for a majority of their year-round operations would not be able to reduce the size of their herds and continue to operate on their private and state land. Only 7% of the Sandy area is State and private land (MAP 1-2). Four operators could reduce their herd size and continue in the livestock business for a time, but they could not run enough livestock for their operations to be economical in the long term and eventually would be eliminated from the business.

Fourteen cattle permittees could adjust and remain in the livestock business. This amounts to 29% of the operators in the Sandy area. The adjustments could require a reduction in herd numbers, conversion of hayland to pasture, and/or the purchase of additional feed. Five sheep permittees, or 10% of the operators in the Sandy area, have their major operations outside the area. They currently make fall use of the Sandy area but could adjust their operations to make fall use in other areas by reducing their herd size.

The economic impact could be severe on those operators who would lose large numbers of AUMs or would be forced out of business. This impact is discussed in more detail in the socioeconomic analysis.

Farming

The discontinuance of livestock grazing on NRL would result in greater utilization of the private lands used for hay production. It would be expected that some hayland would be converted to pasture land, resulting in less hay produced. Approximately 20% of the acreage producing hay in the Sandy area is controlled by 16 of the 48 permittees on the Sandy area. The remaining 32 permittees have base properties outside the Sandy area, some of which is used for hay production.

Local consumption of the hay grown in the Eden Valley could increase if hayland would be converted to pasture land. Presently approximately 50% of the hay produced in the Eden Valley is sold elsewhere.

Socioeconomic Conditions

This alternative would have several major impacts to the ranchers of the Sandy area. There would be an immediate loss of 150,288 AUMs (private, State, and Federal) to livestock (TABLE 2-24), resulting in a loss of $3,182,348 of total income per year. In addition it is projected that 60% of the Sandy users would be forced out of business. This would result in the reduction of approximately 28 ranch proprietors and as many as 64 agricultural jobs. Income from maintenance by ranchers would also decline by $19,000 per year.

Recreation income would, however, increase by $563,885 per year (see recreation analysis and Chapter 3 socioeconomic conditions section).

There would also be $31,875 per year income for eight years from construction of the checkerboard fence and $11,400 income from fence removal projects.

The attitudes and expectations of the Sandy permittees would undoubtedly be hostile to this alternative in that their means of livelihood would be removed or severely reduced in many cases. On the other hand, those who favor the open spaces and increased wildlife in the area would be extremely satisfied as livestock and most fences would be removed from the Sandy area.

See APPENDIX 3E and Chapter 3 socioeconomic conditions section for methodologies used in this analysis.

ALTERNATIVE 3-ALLOW CONVERSIONS WITHOUT FENCING

DESCRIPTION

Under this alternative, the existing allotment and individual use pastures would be retained the same as Alternative 1. Operators would be allowed to convert present sheep use to cattle use as stated in the proposed action. Allotments, individual use pastures, and range improvements are shown on MAP 8-3 located at the end of this chapter. The proposed livestock management for this alternative is shown in TABLE 8-31.

Grazing systems, class of stock, season of use, and wildlife and wild horse reservations by allotment are shown on TABLE 8-32. Wildlife and wild horse competitive reservations differ from the proposed action as shown in TABLE 8-32 for the Steamboat Mountain, Red Desert, Bush Rim, Continental Peak, Pacific Creek, and Sands Allotments because the allotment boundaries are different. The total competitive reservations and total forage provided for wildlife and wild horses within the Sandy area are the same for this alternative as for the proposed action except for the adjustments made for the

TABLE 8-31

PROPOSED LIVESTOCK MANAGEMENT UNDER ALTERNATIVE 3

	Acres	Total Livestock AUMs	Number of Areas
Allotment Management	1,957,604	122,676*	18
Custodial Management	39,726	2,290**	34
No Grazing	970	0	1
Federal Withdrawals	1,750	0	3
	2,000,050	124,966	56

* Includes Federal, State and private AUMs (See TABLE 8-32).

** Federal AUMs only.

Buckskin-Sandy and Sandy (I-28) individual use pastures (TABLE 8-32).

Four treatments are used in various combinations to make up the three different grazing systems proposed for this alternative (TABLE 8-33). The two pasture and three-pasture deferred systems are described in Chapter 1. The season-long grazing system is described under Alternative 1. There would be no change in the management of individual use pastures. Class of stock, season of use, and AUMs for individual use pastures are the same as Alternative 1 (TABLE 8-4).

Existing fences as shown on MAP 8-3 would remain. Proposed fences are limited to the southern boundary (checkerboard boundary) fence shown on the same map. Water developments would be the same as the proposed action; however, fencing of waters would be limited to springs. No existing waters would be fenced. Since the Buckskin-Sandy and I-28 pastures would remain as individual use pastures under this alternative, the two earth-fill reservoirs proposed for this area in Chapter 1 (see MAP 1-5) would not be constructed.

Livestock use in unfenced allotments would be controlled by herding. Herding of livestock would be the responsibility of the operator. Analysis of this alternative assumes that herding would be used to accomplish the following:

1. Control of livestock within the prescribed season and area of use.
2. Distribution of livestock among water developments.
3. Assure compliance with trailing requirements.
4. Removal of trespass livestock from adjacent allotments.

Range supervision for this alternative would involve BLM employees making routine allotment inspections to ensure compliance with the above items. Administrative actions related to unauthorized use (trespass) would be taken in accordance with BLM Manual 9230. Because there would be no fencing of allotment boundaries, standard BLM allotment boundary signs mounted on gray fence posts would be located as shown on MAP 8-3 at sites where they are easily visible.

ANALYSIS OF ALTERNATIVE 3 IMPACTS

Impacts on the existing environment's resources and land uses that would or could occur as a result of implementation of this alternative are analyzed in two stages: short term (eleven years following completion of this statement, or 1988) and long term (23 years following completion of this statement, or 2000). The analysis follows the same general pattern used to analyze the proposed action.

Soils

Sheet Erosion

Anticipated decreases in ground cover from implementation of this alternative (see vegetation analysis) would increase the estimated sheet erosion rate in the Sandy area by 494,817 tons per year to a total of approximately 8,873,427 tons per year in 23 years (TABLE 8-34). Long-term increases would vary in the proposed allotments, depending upon the soil associations present. A detailed analysis of soil association erosion by pasture is available for review upon request from the Rock Springs District Office. In allotments under existing AMPs (Bar X, Fish Creek, and Gold Creek Allotments), total ground cover would increase with corresponding decreases in sheet erosion.

The Musgrave Equation was used to compare the changes in sheet erosion rates. These calculations depend largely upon the projected long-term increases in litter accumulation and canopy cover (TABLE 8-42) which were used to adjust the ground cover factor in the equation. APPENDIX 2B outlines how these calculations were made.

Mapping Units 132, 233, and 333 would continue to erode at high rates. Approximately 88,630 acres of these soils are found in the Steamboat Mountain, Bush Rim, Continental Peak, and Pacific Creek Allotments. A detailed analysis by soil association in each pasture is available for review upon request from the Rock Springs District Office.

The large decreases in total ground cover over mapping units with sagebrush-grass vegetation type (vegetation analysis TABLE 8-42) on slopes of 4 to 14% would be expected to cause the greatest increases in sheet erosion. Marked increases in sheet erosion would be anticipated on 1,021,056 acres (51% of the Sandy area) in the Little Colorado, Red Desert, Bush Rim, Continental Peak, Pacific Creek, White Acorn, and Pine Creek Allotments.

Large increases in total ground cover would be anticipated on mapping units with sagebrush-grass vegetation in allotments with existing AMPs: the Bar X, Fish Creek, and Gold Creek Allotments. Sheet erosion would be reduced on an estimated 22,098 acres, or 49% of the above allotments.

Large decreases in total ground cover on meadow soils (Mapping Units 210 and 310) and saltbush-winterfat soils (111, 117, and 126) would increase sheet erosion very little due to the nearly level surface where these soils occur. The same would occur for the grass vegetation soil (211). Very little change in sheet erosion rates would be anticipated on soils in forested areas, mountain slopes, and sand dune areas due to little change in total ground cover. Exact amounts of reductions are available for review upon request from the Rock Springs District Office.

The guidelines for acceptable average erosion (Soil Conservation Service 1973) were used to determine the acres of erosion by class under this alternative. The excessive erosion category would increase by 12,731 acres to 432,365 acres. Moderate sheet erosion would occur on 1,480,582 acres, or 62,817 acres more than existing conditions. The increase in acres in excessive and moderate

TABLE 8-32

PROPOSED MANAGEMENT AND USE LEVELS BY ALLOTMENT UNDER ALTERNATIVE 3

Allotment And Acres	Grazing System	Proposed Livestock Use in AUMs 1/: Class of Livestock	Season of Use	Federal Land Use: Livestock	Federal Land Use: Trailing Use	State & Private Land Use 2/	Total Livestock Use	Wildlife 3/: Compet. Reserv. In AUMs 1/	Wildlife 3/: Total Allow. In AUMs 1/	Wild Horses 3/: Compet. Reserv. In AUMs 1/	Wild Horses 3/: Total Allow. In AUMs 1/	Total Forage Use 4/ Area In AUMs 1/
1. Bar X	Deferred	Cattle	06/01-10/15	355		437	792					
6,895	3-Pasture	Sheep	06/01-10/15	32		38	70					
		Horses	06/01-10/15	7		10	17					
		TOTALS		394	None	485	879	74	519	None	None	1,398
2. Fish Creek	Deferred	Cattle	05/16-08/15	657		231	888					
7,237	2-Pasture											
		TOTALS		657	None	231	888	6	55	None	None	943
3. Gold Creek*	Deferred	Cattle	06/01-10/31	2,137		686	2,823					
24,580	3-Pasture Grazing											
		TOTALS		2,137	None	686	2,823	217	971	None	None	3,794
3a. Willow Creek*	Season Long	Cattle	06/01-10/31	555		143	698					
5,945	Grazing											
		TOTALS		555	None	143	698	58	258			956
4. Little Sandy*	Season Long	Cattle	05/16-10/31	6,097	326	1,295	7,718					
114,879	Grazing	TOTALS		6,097	326	1,295	7,718	877	7,175	None	None	14,893
4a. Little Prospect*	Season Long	Cattle	05/16-10/31	1,982			1,982	237				
70,781	Grazing	Sheep	05/10-10/05	3,117	102		3,219	282				
		TOTALS		5,099	102	0	5,201	519	1,942	None	None	7,143
5. Steamboat Mountain	Season Long	Cattle	05/01-12/15	1,301		199	1,500					
38,276	Grazing	Sheep	Spring		80		80					
		Sheep	Fall		20		20					
		TOTALS		1,301	100	199	1,600	429	1,344	None	None	2,944
6. Little Colorado*	Season Long	Cattle	05/01-01/31			128	128					
726,956	Grazing	Cattle	05/01-06/30									
		Cattle	05/16-10/31	16,590	On Demand		16,590					
		Sheep	05/01-11/30			650	650					
		Sheep	05/01-12/15	26,027	On Demand		26,027					
		Sheep	06/01-12/15									
		TOTALS		42,617		778	43,395	671	3,279	486	1,800	48,474
7. Red Desert*	Season Long	Cattle	05/01-12/15	8,786		923	9,709					
252,229	Grazing	Sheep	11/01-12/15	5,219		415	5,634					
		Dual			146		146					
		TOTALS		14,005	146	1,338	15,489	203	1,067	2,081	5,277	21,833
8. Bush Rim*	Season Long	Cattle	05/01-12/15	2,070		102	2,172					
100,437	Grazing	Sheep	07/10-12/15	2,384		90	2,474					
		Sheep			276		276					
		TOTALS		4,454	276	192	4,922	461	1,988	504	1,340	8,250
9. Continental Peak*	Season Long	Cattle	05/01-12/15	1,323		200	1,523					
89,914	Grazing	Sheep	05/01-07/15	4,682		540	5,222					
		Sheep	07/16-10/15									
		Sheep	10/16-12/15									
		Dual			58		58					
		TOTALS		6,005	58	740	6,803	212	998	377	1,183	8,984
10. Pacific Creek*	Season Long	Cattle	05/01-12/15	4,208		499	4,707					
203,738	Grazing	Sheep	05/15-10/31	6,375		563	6,938					
		Sheep			240		240					
		TOTALS		10,583	240	1,062	11,885	1,085	5,040	None	None	16,925
11. Sands*	Season Long	Cattle	05/01-12/15	3,262		75	3,337					
112,051	Grazing	Sheep	11/01-12/15	735		13	748					
		Dual			100		100					
		TOTALS		3,997	100	88	4,185	550	2,304	None	None	6,489
12. White Acorn*	Season Long	Cattle	06/01-10/15	2,286		782	3,068					
46,794	Grazing	Sheep	05/16-10/31	1,460		500	1,960					
		Sheep			349		349					
		Cattle			7		7					
		TOTALS		3,746	356	1,282	5,384	217	1,279	None	None	6,663

TABLE 8-32 (Continued)

PROPOSED MANAGEMENT AND USE LEVELS BY ALLOTMENT UNDER ALTERNATIVE 3

Allotment And Acres	Grazing System	Proposed Livestock Use in AUMs 1/: Class of Livestock	Season of Use	Livestock	Trailing Use	State & Private Land Use 2/	Total Livestock Use	Wildlife 3/: Compet. Reserv. In AUMs 1/	Total Allow In AUMs 1/	Wild Horses 3/: Compet. Reserv. In AUMs 1/	Total Allow. In AUMs 1/	Total Forage Use Area In AUMs 1/ 4/
13. Prospect Mountain 56,623	Season Long Grazing	Cattle	05/16-10/31	1,744		340	2,084					
		Sheep	05/16-09/10	1,151		193	1,334					
		Cattle	Spring		6		6					
			Fall		5		5					
		Sheep	Spring		127		127					
			Fall		80		80					
		TOTALS		2,895	218	523	3,636	81	2,947	None	None	6,583
14. Reservoir 35,545	Season Long Grazing	Cattle	10/16-10/31	80		20	100					
		Sheep	05/05-10/31	1,669		469	2,138					
		Horses	05/16-10/31	94		26	120					
		TOTALS		1,843	None	515	2,358	74	563	None	None	2,921
15. Poston* 50,635	Season Long Grazing	Cattle	05/16-06/30	300		81	381					
		Cattle	07/01-10/11	242			242					
		Sheep	05/05-07/10	979		440	1,419					
		Sheep	09/10-12/15	1,909			1,909					
		Horses	05/16-10/31	98			114					
		Dual			84	16	84					
		TOTALS		3,528	84	537	4,149	124	1,047	None	None	5,196
16. Pine Creek* 14,089	Season Long Grazing	Cattle	07/01-10/31	732		103	835					
		Sheep	07/01-09/07	184		26	210					
		Horses	04/16-12/31	69		10	79					
		TOTALS		985	None	139	1,124	15	140	None	None	1,264
TOTAL 5/ 1,957,604				110,898	2,006	10,233	123,137	5,873	32,916	3,448	9,600	165,653

*Indicates an operator's desire to convert from a previously adjudicated class of livestock to that class as shown to a class of livestock from that adjudicated.

1/ An AUM is the amount of forage 1 cow, 5 sheep, 14.6 pronghorn, 5 deer, 1.5 elk, 1 moose, or 1 horse would eat in 1 month.

2/ This includes the state and private land AUMs that would be available as exchange of use (see Glossary).

3/ Competitive reservations are the portions of the livestock diets that overlap with those of wildlife and wild horse diets and which are needed to assure proper amounts of forage would be available for the numbers of wild animals expected in each allotment. Total allowance is the sum of these reservations and the additional forage available that wildlife and/or wild horses would use, but livestock would not use. Wild horse allowances represent enough forage for 800 animals for one year (800 X 12 = 9,600 AUMs), or the number of horses that are recommended for the area in the BLM's draft wild horse unit management plans. Wildlife allowances are based on the number of months each species would be expected in each allotment; numbers of animals are estimated from population data provided by the Wyoming Game and Fish Department at the time the AMPs were developed.

4/ Total forage use is the sum of the total livestock use and the total allowances for wildlife and wild horses.

5/ 11,361 acres of the Buckskin-Sandy and Sandy (I-28) individual use pastures are not included in the Prospect Mountain Allotment for this alternative. See TABLE 8-8.

TABLE 8-33

PROPOSED GRAZING SYSTEMS UNDER ALTERNATIVE 3

System	Number of Allotments	Acres
Two-Pasture Deferred Grazing	1	7,237
Three-Pasture Deferred Grazing	2*	31,475
Season Long Grazing	15**	1,918,892
TOTALS	18	1,957,604

* The Gold Creek Allotment is divided into two allotments: the Gold Creek portion utilizing a three-pasture deferred system and the Willow Creek portion utilizing season-long grazing.

** The Little Sandy-Little Prospect Allotment is divided into two allotments: the Little Sandy and the Little Prospect, both utilizing season-long grazing.

TABLE 8-34

LONG-TERM SHEET EROSION UNDER ALTERNATIVE 3

Allotment Pasture	Acres	Geologic Erosion Tons/Year	Other Sheet Erosion Tons/Year	Total Erosion Tons/Year
1. Bar X				
1	2,124	1,950	1,278	3,228
2	2,543	2,334	743	3,077
3	2,228	2,143	308	2,451
Total	6,895	6,427	2,329	8,756
2. Fish Creek				
1	3,389	3,111	2,480	5,591
2	3,848	3,532	3,048	6,580
Total	7,237	6,643	5,528	12,171
3. Gold Creek				
1	4,662	4,280	3,506	7,786
2	10,591	9,723	9,235	18,958
3	9,327	8,562	6,828	15,390
Total	24,580	22,565	19,569	42,134
3a. Willow Creek	5,945	5,458	5,124	10,582
4. Little Sandy	114,879	105,459	314,998	420,457
4a. Little Prospect	70,781	64,977	160,814	225,791
5. Steamboat Mountain	38,276	35,137	625,890	661,027
6. Little Colorado	726,956	667,346	1,993,313	2,660,659
7. Red Desert	252,229	231,546	482,262	713,808
8. Bush Rim	100,437	92,201	808,719	900,920
9. Continental Peak	89,914	82,541	633,174	715,715
10. Pacific Creek	203,738	187,029	1,061,867	1,248,896
11. Sands	112,051	102,863	408,090	510,953
12. White Acorn	46,794	42,957	155,450	198,407
13. Prospect Mountain	56,623	51,980	146,767	198,747
14. Reservoir	35,545	32,630	72,228	104,858
15. Poston	50,635	46,483	151,500	197,983
16. Pine Creek	14,089	12,934	28,629	41,563
Total	1,957,604	1,797,176	7,076,251	8,873,427

sheet erosion would be reflected in the reduction of 85,676 acres in the light category (TABLE 8-35).

Reservoirs and watering troughs are areas that would receive increased use. Animals would trample the vegetation and compact the soil around these areas. Construction at these sites would also cause large areas of bare ground. Runoff from these areas would significantly reduce the life expectancy of reservoirs and pits if left unfenced and unmaintained (Chapter 3 soils section). Sediment contributed by sheet erosion to reservoirs and pits would only be reduced by 10 tons per acre per year to 612 tons per acre per year. Sheet erosion would still continue to reduce water quality and impair aquatic habitat.

Wind Erosion

The impacts would be the same as discussed under Alternative 1.

Compaction

The relative degree of use by livestock in the short and long terms under Alternative 3 was estimated using a technique similar to that used in APPENDIX 2D for the current relative degree of use. TABLE 8-36 shows acres effectively used by livestock (acres in the light, moderate, heavy, and severe intensity classes) would increase under this alternative from 918,463 acres presently (TABLE 2-6) to 1,108,050 acres in the short term and 1,088,747 acres in the long term. This increased acreage is largely a result of the increased available water that would be supplied by this alternative. While increased available water would result in more even grazing throughout the pastures, the season-long grazing system of most allotments would cause the 63,334 acres of soil in the severe and heavy intensity of use categories to receive season-long compaction each year over the short term. This would cause a reduction in infiltration rates, increased runoff and erosion, and lost soil productivity.

Livestock grazing intensity in the Bar X, Fish Creek, Gold Creek, Willow Creek, and Prospect Mountain Allotments would increase over the long term due to increases in AUMs used (TABLE 8-43). Grazing intensity in the Little Prospect, Little Colorado, Red Desert, Bush Rim, Pacific Creek, and White Acorn Allotments would decrease. Grazing intensity would remain unchanged in the Little Sandy, Steamboat Mountain, Continental Peak, Sands, Reservoir, Poston, and Pine Creek Allotments. There would be a total decrease of 9,342 AUMs used in the Sandy area, which would result in a corresponding decrease in grazing intensity. Acres in the heavy and severe intensity classes would be reduced over the long term by 10,818 acres in allotments where soil compaction would be expected to occur (TABLES 2-6 and 8-36). Severe and heavy intensity classes would total 52,516 acres in the long term.

Water Resources

Water Use

Water consumption by livestock under this alternative would be 107 acre-feet per year at the end of the twenty-third year and 115 acre-feet per year during the first eleven years (TABLE 8-37). This would be an increase of 43 acre-feet per year in the short term and 35 acre-feet per year in the long term above existing water use levels (TABLE 2-7). This increase in consumptive use by livestock is due to a proposed increase in active AUMs over the present actual use (TABLE 1-1). The decrease in the long term would be due to a decrease in production (TABLE 8-43) and corresponding reduction in livestock numbers.

Evaporation losses would increase 407 acre-feet per year in 23 years because of the proposed 94 reservoirs and pits (TABLE 8-38). Total evaporation loss from reservoirs in the Sandy area would be 1,283 acre-feet per year in the long term.

Streamflow

Alternative 3 would have an unmeasurable effect on streamflow in perennial streams within or downstream from the Sandy area. Refer to Alternative 1 for analysis of streamflow.

Storm runoff from a ten-year event would increase 24% above existing levels in the Sandy area at the end of 23 years and 1% at the end of eleven years (TABLE 8-39). This increase is due to decreased infiltration rates under season-long grazing and a projected long-term decrease in vegetation cover (see vegetation analysis). Runoff was calculated using model basins as explained in Alternative 1.

Ten-year storm runoff from the Bar X, Fish Creek, Little Sandy, Little Prospect, Steamboat Mountain, Prospect Mountain, and Reservoir Allotments would decrease below existing levels due to the decrease in acres in the severe, heavy, moderate, and light intensity of use classes (TABLE 8-36, soils analysis), and it would remain below existing levels at the end of 23 years (TABLE 8-39).

Runoff around the proposed water developments would increase above existing levels. These areas are presently receiving little grazing use by livestock. Grazing intensity decreases as the distance from water increases (Mueggler 1965). Infiltration rates decrease as intensity of livestock use increases (Gifford and Hawkins 1976).

Water Quality

This alternative would have no measurable effect on water quality in perennial streams within the Sandy area or downstream. Perennial streamflow would not be expected to change, and sediment transport would remain unchanged in these streams.

Sediment yield in the intermittent streams in the Sandy area would increase proportionally to the increase in

TABLE 8-35

ACREAGES OF EROSION CLASSES BY ALLOTMENT UNDER ALTERNATIVE 3

Allotment	Light[1/]	Moderate[2/]	Excessive[3/]
Bar X	6,895		
Fish Creek	7,237		
Gold Creek	24,580		
Willow Creek	5,945		
Little Sandy		114,879	
Little Prospect		70,781	
Steamboat Mountain			38,276
Little Colorado		726,956	
Red Desert		252,229	
Bush Rim			100,437
Continental Peak			89,914
Pacific Creek			203,738
Sands		112,051	
White Acorn		46,794	
Prospect Mountain		56,623	
Reservoir		35,545	
Poston		50,635	
Pine Creek		14,089	
TOTAL	44,657	1,480,582	432,365

1/Light - less than 2 tons per acre per year
2/Moderate - 2 to 5 tons per acre per year
3/Excessive - greater than 5 tons per acre per year

TABLE 8-36

PROJECTED SHORT-TERM AND LONG-TERM ACRES OF GRAZING INTENSITY UNDER ALTERNATIVE 3

Allotment	Short-Term Mean					Long-Term Mean				
	Marginal* to Slight*	Light*	Moderate*	Heavy*	Severe*	Marginal* to Slight*	Light*	Moderate*	Heavy*	Severe*
Bar X										
Pasture 1	0	1,595	380	104	45	0	1,521	433	119	51
Pasture 2	0	2,025	364	105	49	0	1,957	412	119	55
Pasture 3	0	1,701	370	107	50	0	1,632	419	121	56
Fish Creek										
Pasture 1	0	2,570	584	163	72	0	2,460	662	185	82
Pasture 2	0	3,047	572	159	70	3,848	2,940	649	180	79
Gold Creek										
Pasture 1	0	2,838	1,338	347	139	0	2,393	1,664	432	173
Pasture 2	0	9,205	1,048	249	89	0	8,843	1,322	314	112
Pasture 3	0	7,772	1,158	288	109	0	7,371	1,436	372	148
Willow Creek	0	4,711	905	235	94	0	4,402	1,131	294	118
Little Sandy	30,984	71,229	9,238	2,434	994	30,984	71,229	9,238	2,434	994
Little Prospect	13,023	49,192	6,276	1,634	656	13,160	49,075	6,261	1,630	655
Steamboat Mountain	21,056	15,066	1,642	381	131	21,055	15,067	1,642	381	131
Little Colorado	362,384	286,065	56,365	15,467	6,675	362,384	295,294	49,739	13,648	5,891
Red Desert	166,065	56,194	21,264	6,007	2,699	166,065	67,128	13,737	3,721	1,578
Bush Rim	32,383	15,022	46,435	5,318	1,279	45,744	47,476	5,437	1,307	473
Continental Peak	32,177	45,748	8,817	2,272	900	32,177	45,748	8,817	2,272	900
Pacific Creek	75,470	110,152	13,433	3,383	1,300	91,452	96,428	11,759	2,961	1,138
Sands	75,449	29,752	5,141	1,250	459	75,449	29,752	5,141	1,250	459
White Acorn	4,063	32,964	7,094	1,890	783	4,063	34,138	6,242	1,662	689
Prospect Mountain	18,449	32,671	4,060	1,037	406	8,276	41,378	5,142	1,313	514
Reservoir	11,142	20,505	2,801	767	330	11,142	20,505	2,801	767	330
Poston	5,041	38,613	5,073	1,350	558	5,041	38,613	5,073	1,350	558
Pine Creek	1,865	10,376	1,348	355	145	1,865	10,376	1,348	355	145
TOTAL**	849,551	849,013	195,706	45,302	18,032	868,857	895,726	140,505	37,187	15,329

***Marginal** - Those acres generally too distant from water to be grazed.
Slight - Those acres within reach of water but grazed at an intensity greater than 75 acres/AUM.
Light - Grazing intensity from 16 to 75 acres/AUM.
Moderate - Grazing intensity from 5.5 to 16 acres/AUM.
Heavy - Grazing intensity from 2 to 5.5 acres/AUM.
Severe - Grazing intensity less than 2 acres/AUM.

****Totals by class will not total to exact acreages in allotments due to rounding inherent in method of calculation.**

TABLE 8-37

WATER USE BY LIVESTOCK, INCLUDING EXCHANGE IN USE, UNDER ALTERNATIVE 3

Allotment	Short Term in Acre-Feet Per Year*	Long Term in Acre-Feet Per Year*
Bar X	0.79	0.88
Fish Creek	0.82	0.91
Gold Creek	2.59	3.10
Willow Creek	0.64	0.77
Little Sandy	7.09	7.10
Little Prospect	4.78	4.78
Steamboat Mountain	1.47	1.47
Little Colorado	39.84	35.95
Red Desert	14.22	9.67
Bush Rim	4.52	4.61
Continental Peak	6.24	6.26
Pacific Creek	10.91	9.85
Sands	3.84	3.85
White Acorn	4.94	4.46
Prospect Mountain	3.34	4.04
Reservoir	2.16	2.17
Poston	3.81	3.82
Pine Creek	1.03	1.03
TOTAL FOR ALLOTMENTS	113.03	104.72
Individual Use Pastures**	2.11	2.11
TOTAL	115.14	106.83

* Based on use of 300 gallons per AUMs.
** From national resource land AUMs.

TABLE 8-38

EVAPORATION LOSSES BY THE PROPOSED RESERVOIRS AND PITS UNDER ALTERNATIVE 3

Allotment	Number of Proposed Pits	Number of Proposed Reservoirs	Evaporation Losses (Acre-Feet) Pits	Evaporation Losses (Acre-Feet) Reservoirs	Total
Bar X	2	0	2.98	0	2.98
Fish Creek	1	0	1.49	0	1.49
Little Sandy	5	13	7.45	76.18	83.63
Little Prospect	5	11	7.45	64.46	71.91
Steamboat Mountain	3	2	4.47	11.72	16.19
Continental Peak	0	3	0	17.58	17.58
Sands	11	1	16.39	5.86	22.25
White Acorn	0	9	0	52.74	52.74
Prospect Mountain	1	10	1.49	58.60	60.09
Reservoir	2	3	2.98	17.58	20.56
Poston	3	8	4.47	46.88	51.35
Pine Creek	0	1	0	5.86	5.86
Totals	33	61	49.17	357.46	406.63

Reservoir evaporation rate = 5.86 acre-feet/year and pit evaporation rate = 1.49 acre-feet/year (APPENDIX 2E).

TABLE 8-39

MODEL STORM RUNOFF IN ACRE-FEET BY ALLOTMENT UNDER ALTERNATIVE 3
(10-YEAR STORM)

Allotment	Existing	Short Term	Long Term
Bar X	1.5	1.5	0.5
Fish Creek	0.9	0.8	0.8
Gold Creek	16.5	20.2	17.1
Little Sandy	64.3	60.8	60.8
Little Prospect	13.9	15.6	15.6
Steamboat Mountain	120.8	29.8	29.8
Little Colorado	14.7	16.0	21.7
Red Desert	17.1	19.1	22.2
Continental Peak	82.9	86.5	111.4
Pacific Creek	58.2	51.1	78.3
Sands	2.0	26.7	26.7
White Acorn	12.8	14.0	18.1
Prospect Mountain	11.4	10.1	10.1
Reservoir	22.1	21.7	21.7
Poston	15.5	16.8	16.8
Pine Creek	2.2	2.0	4.5
Weighted Mean	29.5	29.9	36.6
Percent Change		+1%	+24%

storm runoff (TABLE 8-39). The PSIAC method (APPENDIX 2F) was applied to Alternative 3, and these calculations indicate there would be a 13% increase in sediment yield. Total sediment yield would be 2,221,436 tons per year. However, sediment transport will decrease on the Bar X, Fish Creek, Steamboat Mountain, Prospect Mountain, and Reservoir Allotments in 23 years because of a decrease in runoff in these allotments (TABLE 8-39).

It is estimated that all 61 earthfill type reservoirs would create some degree of headcutting and channel degradation during the project life if not maintained. The headcutting would increase sediment loads, thus degrading water quality (Chapter 3, water resources section). Headcutting would occur when the maximum permissible velocities are exceeded (TABLE 3-11).

Channel stability would decrease in the Sandy area due to increased grazing intensity (TABLES 8-40 and 8-41). Channel stability is a measure of the erodibility of bed and bank sediment. Channel stability was evaluated by determining the relative grazing intensity of livestock, the length of rest of each pasture, and the improvement potential (APPENDIX 3A). Channel stability would increase, decreasing bank erosion in the Gold Creek, Bar X, and Fish Creek Allotments (TABLE 8-40). This is due to a decrease in livestock grazing intensity along streams during the grazing period (TABLE 8-41).

The concentration of dissolved solids would increase during runoff events in the intermittent streams within the Sandy area due to an increase in sediments (Chapter 3 water resources). Sediment has been identified as a major factor in salinity levels (Chapter 3 water resources). Salinity levels would increase on the Bar X, Fish Creek, Steamboat Mountain, Prospect Mountain, and Reservoir Allotments due to a projected increase in sediment yield. Salinity levels would increase around the proposed water developments due to a projected increase in sediment yield. This effect would last for the life of the individual project. Salinity would increase below the proposed reservoirs due to headcutting if not maintained.

Fecal coliforms (indicators of bacteriological contamination) from livestock grazing on NRL would increase above existing levels because of increased grazing intensity. Refer to Alternative 1 for discussion of analysis.

Vegetation

This alternative includes two- and three-pasture deferred grazing systems on three allotments (Bar X, Fish Creek, and Gold Creek), totaling 38,712 acres (TABLE 8-32). Seasonlong grazing would occur on the remaining fifteen allotments containing a total of 1,918,892 acres.

Vegetation Types

The type acreages for the Sandy area as shown on TABLES 2-13 and 2-14 would not be expected to change significantly.

Season-Long Grazing. Increased season-long cattle use would occur in the Little Colorado, Red Desert, Bush Rim, Continental Peak, Pacific Creek, Sands, White Acorn, Poston, and Pine Creek Allotments. A major cause of range deterioration is selective grazing of plants and range areas in similar yearly patterns (Hormay 1970). This would occur under continuous, season-long use by livestock. Plants repeatedly grazed throughout the growing season would not be allowed to produce enough leaf growth to restore the root reserves used to maintain the plant during the dormant season and start growth in the spring.

The more desirable plants are vulnerable to this selective grazing by livestock. These plants would continue to be weakened and eventually be replaced by less desirable plants that can continue to maintain vigor because of lighter grazing. This could result in an increase of shrubs as well as undesirable grasses over the long term.

As the vigor of the more desirable plants would be reduced, the size of the plant would become smaller and less plant material would be produced. Less desirable and less productive plants would eventually increase, changing plant composition. Percent ground cover could decrease in the sagebrush-grass, saltbush-winterfat, grass, and meadow types over the long term (TABLE 8-42).

Forage Production. Long-term production would decrease slightly in the Sandy area under continuous grazing. The decrease would occur in four allotments: Little Colorado, Red Desert, Pacific Creek, and White Acorn Allotments. Predicted long-term production for all allotments is found in TABLE 8-43.

Range Condition and Trend. Apparent trend, now primarily static (TABLE 2-31), should over the long term start downward, thus the range condition should decrease an average low fair condition over the same period.

Deferred Grazing System. The deferred grazing systems proposed for the Bar X, Gold Creek, and Fish Creek Allotments would afford a deferment of grazing to seedripe in the two-pasture system of Fish Creek and three-pasture system of Gold Creek and to peak of flowering and seedripe dates in the three-pasture system of Bar X. This would allow the plants to maintain their vigor and produce seed. No rest would be allowed for seedling establishment, but plant composition would not be expected to change as adequate rest would be provided to maintain the present situation. Ground cover should improve as reflected in TABLE 8-42. This would be the result of increased vigor and litter at the end of the grazing season.

Forage production would increase over the long term on those three allotments under deferred grazing systems. The predicted increase would mostly be a result of the increased vigor in the meadow type. Range condition and trend for all species should improve on the three allotments with deferred grazing. This would be a result of the improved vigor on the desirable species.

TABLE 8-40

PROJECTED CHANNEL STABILITY RATING
BY ALLOTMENT UNDER ALTERNATIVE 3*

Allotment	Stream Miles	Present	Potential	23-Years (Future)
Bar X	9.00	99	79	92
Fish Creek	5.50	92	84	87
Gold Creek	29.75	96	90	93
Willow Creek	9.25	98	93	114
Little Sandy	35.00	110	90	126
Little Prospect	7.25	95	77	115
Steamboat Mountain	9.50	110	89	119
Little Colorado	60.25	94	86	105
Continental Peak	6.25	99	79	108
Pacific Creek	48.00	107	92	117
White Acorn	22.75	96	81	112
Prospect Mountain	24.75	103	98	122
Reservoir	14.50	111	111	126
Poston	3.00	104	104	115
Pine Creek	10.50	97	92	105
TOTAL MILES	295.25			
WEIGHTED MEAN		100	90	112
PERCENT CHANGE			-10%	+12%

* Channel Stability Rating	Condition
38	Excellent
39-76	Good
77-95	High Fair
96-114	Low Fair
115+	Poor

TABLE 8-41

RELATIVE GRAZING INTENSITY 100 YARDS FROM WATER
UNDER ALTERNATIVE 3

Allotment	Existing	Short-Term
Bar X	92	78
Fish Creek	65	74
Gold Creek	44	34
Willow Creek	44	59
Little Sandy	59	49
Little Prospect	59	44
Steamboat Mountain	7	8
Little Colorado	60	69
Red Desert	3	83
Bush Rim	1	16
Continental Peak	35	54
Pacific Creek	10	31
Sands	15	32
White Acorn	45	65
Prospect Mountain	42	28
Reservoir	67	57
Poston	49	55
Pine Creek	35	46
Mean	38	55
Percent Change		+45%

*A relative intensity of 1 is the lowest intensity in the Sandy area and a relative intensity of 100 is the highest (APPENDIX 2D).

TABLE 8- 42

PROJECTED LONG-TERM AVERAGE PERCENT GROUND COVER AND VEGETAL COVER UNDER ALTERNATIVE 3

	Sagebrush-Grass		Saltbush-Winterfat		Grease-wood		Meadow		Grass		Perennial Forbs		Mountain Shrub		Conifer	
Allotments	Ground Cover	Vegetal Cover	% Cover	% Cover	% Cover	% Cover	% Cover	% Cover	% Cover	% Cover	% Cover	% Cover	% Cover	% Cover	% Cover	% Cover
Bar X	60	17					94	30								
Fish Creek	46	15					91	26								
Gold Creek	40	17					73	25					95	18	78	9
Willow Creek	33	17					73	25					79	18	78	19
L. Sandy-	39	15					86	30					77	12		
L. Prospect	39	15					77	30					77	12		
Steamboat Mountain	49	11			56	12	60	22			16	6	79	18		
L. Colorado	20	17	20	15	28	11	24	32	22	23					27	12
Red Desert	22	14	23	9	22	6			14	15	16	9				
Bush Rim	22	13	36	11	14	16	68	18	14	15	16	12	64	19	78	9
Continental Peak	38	16	14	7	74	11	68	19	14	14	22	14	94	19		
Pacific Creek	32	14	58	6	22	21	57	17	38	12	11	12	94	16	76	11
Sands	29	15			14	12	65	23	32	16	11	12	94		74	8
White Acorn	43	16					65	29					53	14	78	11
Prospect Mountain	36	15					56	30					77	16	93	3
Reservoir	32	12					49	28							3	
Poston	28	13					51	30								
Pine Creek	45	15					45	26								
Total Averages	36	15	30	10	33	13	65	26	22	16	15	11	79	16	73	9

TABLE 8-43

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 3 BY ANIMAL CLASS IN AUMS AND POUNDS OF DRY WEIGHT FORAGE

	Cattle and Domestic Horses		Sheep		Wild Horses	
Allotment	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
1. Bar X	847,080 (1,086)	686,400 (880)	933,750 (1,245)	57,000 (76)	0 (0)	0 (0)
2. Fish Creek	818,220 (1,049)	769,860 (987)	849,000 (1,132)	0 (0)	0 (0)	0 (0)
3. Gold Creek	2,825,160 (3,622)	2,626,260 (3,367)	2,579,250 (3,439)	0 (0)	0 (0)	0 (0)
3a. Willow Creek	614,640 (788)	652,080 (836)	563,250 (751)	0 (0)	0 (0)	0 (0)
4. Little Sandy	6,786,000 (8,700)	6,020,040 (7,718)	7,810,500 (10,414)	0 (0)	0 (0)	0 (0)
4a. Little Prospect	4,555,980 (5,841)	1,545,960 (1,982)	5,206,500 (6,942)	2,406,750 (3,209)	0 (0)	0 (0)
5. Steamboat Mountain	1,404,000 (1,800)	1,170,000 (1,500)	1,509,000 (2,012)	75,000 (100)	0 (0)	0 (0)
6. Little Colorado	28,266,420 (36,239)	11,856,000 (15,200)	29,670,000 (39,560)	17,887,500 (23,850)	32,615,100 (36,239)	1,620,000 (1,800)
7. Red Desert	8,585,460 (11,007)	5,144,880 (6,596)	11,616,750 (15,489)	2,935,500 (3,914)	9,906,300 (11,007)	4,749,300 (5,277)
8. Bush Rim	4,707,300 (6,035)	1,683,240 (2,158)	5,292,000 (7,056)	2,136,000 (2,848)	5,431,500 (6,035)	1,206,000 (1,340)
9. Continental Peak	4,978,740 (6,383)	1,169,220 (1,499)	5,466,750 (7,289)	3,978,000 (5,304)	5,744,700 (6,383)	1,064,700 (1,183)
10. Pacific Creek	7,841,340 (10,053)	3,252,600 (4,170)	9,487,500 (12,650)	4,897,500 (6,530)	0 (0)	0 (0)
11. Sands	4,242,420 (5,439)	2,664,480 (3,416)	4,671,000 (6,228)	576,750 (769)	0 (0)	0 (0)
12. White Acorn	3,775,980 (4,841)	2,158,260 (2,767)	3,678,750 (4,905)	1,558,500 (2,078)	0 (0)	0 (0)
13. Prospect Mountain	4,188,600 (5,370)	1,950,000 (2,500)	4,515,750 (6,021)	1,417,500 (1,890)	0 (0)	0 (0)
14. Reservoir	1,274,520 (1,634)	171,600 (220)	1,683,750 (2,245)	1,603,500 (2,138)	0 (0)	0 (0)
15. Poston	2,693,340 (3,453)	397,980 (737)	3,415,500 (4,554)	2,559,000 (3,412)	0 (0)	0 (0)
16. Pine Creek	943,020 (1,209)	712,920 (914)	1,179,750 (1,573)	157,500 (210)	0 (0)	0 (0)
TOTALS	89,348,220 (114,549)	44,808,660 (57,447)	100,128,750 (133,505)	42,246,000 (56,328)	53,697,600 (59,664)	8,640,000 (9,600)

TABLE 8-43 (Cont'd)

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 3 BY ANIMAL CLASS
IN AUMS AND POUNDS OF DRY WEIGHT FORAGE

	Antelope		Deer		Elk		Moose	
Allotment	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
1. Bar X	561,782 (697)	29,822 (37)	626,430 (1,330)	75,360 (160)	0 (0)	0 (0)	0 (0)	0 (0)
2. Fish Creek	807,612 (1,002)	36,270 (45)	1,047,504 (2,224)	75,360 (160)	0 (0)	0 (0)	359,100 (665)	19,440 (36)
3. Gold Creek	1,848,964 (2,294)	120,900 (150)	2,177,904 (4,624)	399,879 (849)	2,266,380 (4,197)	317,520 (588)	631,260 (1,169)	37,800 (70)
3a. Willow Creek	405,418 (503)	33,046 (41)	472,884 (1,004)	95,142 (202)	527,580 (977)	129,600 (240)	136,620 (253)	14,040 (26)
4. Little Sandy	9,040,902 (11,217)	490,854 (609)	9,215,115 (19,565)	1,988,091 (4,221)	1,976,940 (3,661)	967,140 (1,791)	779,220 (1,443)	122,580 (227)
4a. Little Prospect	6,027,268 (7,478)	301,444 (374)	6,143,724 (13,044)	1,211,883 (2,573)	1,317,600 (2,440)	1,007,100 (1,865)	519,480 (962)	104,220 (193)
5. Steamboat Mountain	1,774,812 (2,202)	124,124 (154)	1,764,366 (3,746)	72,534 (154)	1,876,500 (3,475)	77,760 (144)	0 (0)	0 (0)
6. Little Colorado	45,854,146 (56,891)	2,414,776 (2,996)	6,581,283 (13,973)	168,618 (358)	1,189,080 (2,202)	0 (0)	0 (0)	0 (0)
7. Red Desert	13,311,090 (16,515)	519,870 (645)	4,902,168 (10,408)	424,842 (902)	1,520,640 (2,816)	99,360 (184)	0 (0)	0 (0)
8. Bush Rim	6,055,478 (7,513)	336,102 (417)	3,180,663 (6,753)	176,154 (374)	4,966,920 (9,198)	172,800 (320)	0 (0)	0 (0)
9. Continental Peak	5,528,354 (6,859)	270,010 (335)	4,635,111 (9,841)	538,353 (1,143)	3,104,460 (5,749)	108,000 (200)	0 (0)	0 (0)
10. Pacific Creek	7,783,542 (9,657)	761,670 (945)	8,338,584 (17,704)	313,215 (665)	4,728,780 (8,757)	457,920 (848)	72,900 (135)	53,460 (99)
11. Sands	5,285,748 (6,558)	310,310 (385)	6,337,305 (13,455)	188,871 (401)	5,663,520 (10,488)	228,960 (424)	0 (0)	0 (0)
12. White Acorn	2,893,540 (3,590)	188,604 (234)	3,141,099 (6,669)	756,426 (1,606)	1,695,060 (3,139)	466,560 (864)	966,060 (1,789)	51,840 (96)
13. Prospect Mountain	4,569,214 (5,669)	268,398 (333)	4,752,390 (10,090)	755,955 (1,605)	1,015,740 (1,881)	535,680 (992)	234,360 (434)	58,320 (108)
14. Reservoir	1,810,276 (2,246)	146,692 (182)	1,823,712 (3,872)	349,482 (742)	0 (0)	0 (0)	54,000 (100)	25,920 (48)
15. Poston	3,487,562 (4,327)	146,692 (182)	2,995,560 (6,360)	29,202 (62)	0 (0)	0 (0)	32,400 (60)	19,440 (36)
16. Pine Creek	673,816 (836)	42,718 (53)	657,987 (1,397)	113,511 (241)	187,380 (347)	0 (0)	242,460 (449)	19,440 (36)
TOTALS	117,719,524 (146,054)	6,542,302 (8,117)	68,793,789 (146,059)	7,732,878 (16,418)	32,036,580 (59,327)	4,568,400 (8,460)	4,027,860 (7,459)	526,500 (975)

Threatened or Endangered Plants

The impacts on these two species would be similar to those identified in Alternative 1 vegetation analysis.

Vegetation Production

The long-term production for cattle would be an estimated 114,549 AUMs; 133,505 AUMs were estimated for sheep, 59,664 AUMs for wild horses, 146,054 AUMs for pronghorn antelope, 146,059 AUMs for mule deer, 59,327 AUMs for elk, and 7,459 AUMs for moose (TABLE 8-44). Estimations were made using the same criteria explained in Alternative 1 vegetation analysis.

Range Improvements

Water Developments. Proposed water developments would be the same as the proposed action (TABLE 1-13). Construction of these facilities would have a minimal effect on the vegetation in the Sandy area. There would be between 70 to 90% utilization around these watering facilities for up to one-fourth of a mile radius and 50 to 70% utilization occurring as far as one and one-half miles from the facility. Well distributed watering facilities would allow for good cattle distribution, which in turn would reduce the current degree of utilization around a well, spring, reservoir, or other improvement.

Fence Construction. Impacts of the proposed checkerboard boundary fence would be the same as discussed under Alternative 1 vegetation analysis.

Wildlife

Terrestrial

Impacts from this alternative would affect the populations of the four major wildlife species (pronghorn antelope, mule deer, elk, and moose) as well as sage grouse, waterfowl, and numerous nongame species. The primary factors to be considered relative to the impacts on wildlife populations are food, water, cover, space, and migration habits and the conditions and availability of each factor. The population impacts shown portray a worst case situation that could result only if all potential adverse conditions were to occur simultaneously. Projected populations are based on a summarized qualitative analysis of various elements outlined in the description of the alternative. A detailed analysis by critical element is available for review in the Rock Springs District Office.

Pronghorn Antelope. Antelope populations would decrease by 15% to a level of 8,075 animals in the short term following implementation of Alternative 3.

Food. Forage production on the total Sandy area for pronghorn would be expected to remain approximately the same as for the present situation over the long term (TABLE 8-44). Analysis of forage availability on the crucial winter habitat indicates that forage requirements for the wintering populations within each allotment where this habitat occurs (MAP 2-11) would be adequately satisfied based on the analysis made in Chapter 3.

The additional water developments proposed with this alternative, many of which would be located on crucial winter habitat, would cause increased utilization by livestock and wildlife on areas which presently are not used during the spring and summer. A shortage of antelope winter forage could occur as a result of this situation.

Cover. Based on the analysis of food adequacy for pronghorn on the Sandy area and no anticipated change in the size of the sagebrush-grass habitat, cover requirements should not be affected to any extent. The problems with the sheep-tight highway fences as discussed in Chapter 2 would continue. The proposed fencing of the checkerboard boundary with three-strand wire could create some problems for pronghorn migrating farther south during severe winters to obtain adequate cover (MAP 2-22).

Water. The 139 new water developments would provide improved distribution of livestock and wildlife over the total Sandy area. Proposed pits and earthfill reservoirs are shown on TABLE 8-38, and proposed wells and springs are shown on TABLE 1-13. This situation would reduce utilization on areas that are presently adequately watered, but it would increase utilization on many presently unused areas as discussed in the food analysis above.

Space. This factor relates to the ability of a given animal to move throughout its habitat with a certain degree of ease. Movement within the Sandy area would not be expected to change significantly, thus mobility would continue to be relatively unrestricted. The checkerboard boundary fence as proposed would create some movement complications during severe winters, should the pronghorn be required to move farther south than normal to satisfy their life-sustaining needs for food and cover. No change in availability of space would occur within the Sandy area from implementation of this alternative.

Migration. Present migration patterns would not be expected to be altered from this alternative since additional fencing would not be constructed except for the southern boundary of the Sandy area (checkerboard boundary). Movement by migrating pronghorn could be slowed somewhat as the pronghorn cross into the checkerboard land pattern from the Sandy area (MAP 2-22).

Impacts from this fence on migrating pronghorn population would be slight during most years; heavy losses of 20% or more of the base population could occur during a severe winter. However, it is very possible this heavy death loss could occur in any event as was experienced during the winter of 1971-1972 when this fence was absent.

Mule Deer. The implementation of Alternative 3 would cause a reduction in the mule deer population. The population would be expected to stabilize within the long-term period at approximately 4,680 deer, or 10% below the current population of 5,200.

Food. The vegetation types would not be expected to change in size with implementation of this alternative,

TABLE 8-44

PREDICTED LONG-TERM FORAGE PRODUCTION FOR MAJOR ANIMAL SPECIES
IN THE SANDY AREA WITH IMPLEMENTATION OF ALTERNATIVE 3

Species	AUMs*	Animal Months Provided*	Pounds Available Dry Weight Forage
Cattle	114,549	114,549	89,348,220
Sheep	133,505	667,525	100,128,750
Wild Horses	59,664	59,664	53,697,600
Pronghorn Antelope	146,054	2,132,388	117,719,524
Mule Deer	146,059	730,295	68,793,789
Elk	59,327	88,991	32,036,580
Moose	7,459	7,459	4,027,860

*These figures represent the total proper use grazing capacity for each grazing animal. Example: If the Sandy area were grazed by cattle only, proper use would be 118,790 AUMs; if grazed by sheep only, proper use would be 138,671 AUMs; etc. These figures were developed from the 1964-65 ocular Reconnaissance Range Survey, which is available for review in the Rock Springs District Office. The methodology and an example are shown in Appendix 2I.

and the condition of the range should remain about the same as at present in the long term in Alternative 1. Forage production over the total Sandy area for mule deer would be expected to remain about the same as at present over the long term (TABLES 2-25 and 8-44). Analysis of forage availability on the crucial winter habitat indicates that forage requirements for the wintering populations within each allotment where this habitat occurs (MAP 2-12) would be adequately satisfied (TABLE 3-27 and Chapter 3).

Many of the additional water developments proposed under this alternative would be located on crucial winter habitat. These waters would cause increased utilization by livestock and wildlife on these areas during the spring and summer seasons. A shortage of mule deer winter forage could occur as a result of this situation.

Cover. Based on the analysis of food adequacy for mule deer on the Sandy area and the habitat types showing no change in size or condition, cover requirements should not be affected. The proposed three-wire checkerboard boundary fence may reduce mule deer mobility should they be required to migrate farther south than normal into the checkerboard lands during severe winters to obtain adequate cover for survival.

Water. The 139 new water developments would provide for better distribution of livestock and wildlife over the total Sandy area. This situation would reduce utilization on watered areas that are presently adequate but increase utilization on many crucial winter areas as discussed in the food analysis above.

Space. The space factor should not be changed from implementation of this alternative when considering that additional fencing is not a factor except for the proposed checkerboard boundary fence on the south. Ease of mobility throughout the Sandy area would be unchanged as a result of this alternative.

Migration. Migrational patterns of mule deer are very isolated and involve less than 50% of the Sandy area. These migration patterns would be altered where migration routes cross the proposed checkerboard boundary fence (MAP 2-23).

Elk. Under the present management policy in the Sandy area, a population of 1,165 elk is considered normal and is the desired level according to the Wyoming Game and Fish Department. This figure is expected to be reduced by as much as 10% to a population of approximately 1,000 animals with implementation of this alternative.

Food. Vegetation types used by elk would not be expected to change in size to any significant degree with implementation of this alternative, and the condition of the range should remain about the same as the present in the long term. Forage production for elk over the total Sandy area would be expected to remain at about the same level as at present over the long term (TABLES 2-25 and 8-44). Analysis of forage availability on the crucial winter habitat indicates that forage requirements for the wintering population within each allotment where this habitat occurs (MAP 2-24) would be adequately satisfied (TABLE 3-30 and Chapter 3 wildlife section).

Many of the additional water developments proposed under this alternative would be located on crucial winter habitat. This would cause increased utilization by livestock and wildlife on these areas during the spring and summer. A potential shortage of elk winter forage could occur as a result of this situation.

Cover. Based on the analysis of food adequacy for elk on the Sandy area and the habitat types showing no change in size or condition, cover requirements in general should not be affected. Access to a portion of the crucial winter habitat for necessary cover could be somewhat impaired during severe weather conditions due to the proposed checkerboard boundary fence. Elk losses caused by this fence would be minor except during extreme weather conditions such as heavily crusted and deep snow. These conditions would contribute greatly to a weakened condition of the elk, which could cause the elk to have difficulty negotiating the fence.

Water. The 139 new water developments would provide for improved distribution of livestock and wildlife over the total Sandy area. This situation would reduce utilization on present adequately watered areas but increase utilization on crucial winter areas as discussed in the food analysis above.

Space. The concept of adequate space, or freedom of movement to acquire the critical elements for survival, should not be impacted to any extent except in the crucial winter habitat where the three-wire checkerboard boundary fence is proposed for construction. Impacts to elk as a result of this fence would be as described in the cover analysis above.

Migration. The checkerboard boundary fence would impact elk in the manner described in the cover analysis above. The migration of elk which summer in the Oregon Buttes and Continental Peak areas would occur across the checkerboard boundary, and the identified impacts on elk from the proposed fence would be long term in nature. The degree of impact would be dependent upon the severity of the winter and the physical condition of the animals. The elk in the Prospect Mountain area as identified in Chapter 2 would not be impacted during migration since no additional fences are proposed in that area.

Moose. Current population levels as estimated by the Wyoming Game and Fish Department are approximately 23% (15 to 20 animals) below the current habitat carrying capacity. Implementation of this alternative would cause the moose population to decrease by 10% (5 or 6 animals) in the short term and stabilize at 53 or 54 animals in the long term, regaining 50% of the short-term loss.

Food. Implementation of this alternative would not see a change in size of any of the vegetation types pertinent to moose habitat. Most of the allotments containing moose habitat also have considerable cattle use occurring with especially heavy use on the meadow types. Plant composition could change slightly on the meadow types with continued cattle use as is presently occurring. However, total production for moose would not be expected to change over the long term (TABLE 8-43). Based on

current trend of the range condition, limited change would be expected (TABLE 2-28).

Analysis of forage availability on the crucial winter habitat indicates that forage requirements for the wintering moose population may not be adequate in some allotments based on the analysis in Chapter 3 and TABLE 3-32. Willow availability in these allotments is considered to be one of the major problems. Improved water distribution should cause some relief to the meadows as cattle would be able to graze farther away from the stream bottoms. This would result in more equal utilization of the allotment and reduce grazing pressure on the meadow types and associated vegetation pertinent to moose habitat.

Cover. Cover pertinent to moose should be adequate even with a suspected shortage of forage in some allotments as identified in TABLE 3-32.

Water. Water requirements should be adequate as moose habitat is generally affiliated with wet meadow areas. The 139 new water developments would benefit moose by reducing livestock impacts on their habitat.

Space. This requirement should not be affected by implementation of this alternative since use levels on moose habitat by livestock should be reduced.

Sage Grouse. This alternative could cause a 5 to 20% reduction over the long term in current populations (Chapter 2 wildlife section).

Food and Cover. The sagebrush-grass vegetation type is the primary habitat for sage grouse. The size of this type would not be expected to change with implementation of this alternative, and range condition should remain constant. Based on the food and cover analysis of the other game species common to this vegetation type, adequate forage and cover should be available for sage grouse. Activated nonuse could cause increased trampling on nesting areas. Adequate cover as predicted should mitigate this impact almost completely.

Water. This life-sustaining requirement should improve based on the proposal to construct some 139 new water developments in the Sandy area.

Waterfowl. Resident populations (Chapter 2) would stabilize at present levels with implementation of this alternative.

Food. Predicted increases in water runoff would decrease the quality and diversity of aquatic foods. The 61 reservoirs proposed for construction in eight allotments under this alternative would greatly enhance the carrying capacity for waterfowl.

Cover. Potential increased trampling from activated nonuse may cause problems on the cover element for waterfowl. Conversions from sheep to cattle would likely increase the use around waterfowl habitat; thus increased trampling would occur in the summer breeding habitat.

Space. This element should improve generally when considering the construction of new reservoirs as discussed in the water analysis of this alternative.

Migration. This alternative's proposed new reservoirs should allow more migrating waterfowl to stop and stay longer.

Nongame Species. Current populations would be expected to stabilize in the short term at 1 to 20% below current numbers. A limited recovery from short-term impacts would be expected in the long term. Trampling impacts from livestock and activation of nonuse would be the primary source of damage to nongame species habitat.

Food. Forage allocations have been made for all grazing animals on each allotment according to proper use of forage plants common to a given vegetation type. Activation of nonuse should cause a reduction in forage availability for nongame species from that presently available. However, a reduction in nongame species numbers should in this instance be necessary to bring about the necessary balance of animal numbers in line with forage availability.

Cover. A balance of forage availability would relate directly to adequate cover for all species in this classification. Activation of nonuse may cause increased trampling which could affect populations over the short term. Long-term impacts should be minimal as conditions stabilize.

Water. Construction of new water developments should cause various species to broaden their habitat.

Space. Increased habitat through water availability increases should improve the space requirement of many species.

Threatened or Endangered Species. Peregrine falcons and black-footed ferrets are dependent upon the populations of nongame species as a food source and would be impacted by the fluctuation in those population levels. The nongame population levels would be expected to be reduced by 1 to 20%; therefore, reduction in potential prey would affect these populations accordingly. Peregrine falcons use ducks as a food source. Reduced duck populations would reduce the likelihood of increased peregrine falcon numbers. These impacts should be short-term in nature as conditions would tend to stabilize in the long term.

Range Improvements.

Water Developments. Construction of the proposed 139 new water developments would impact wildlife as discussed throughout this alternative.

Fence Construction. Impacts to wildlife from the proposed three-strand checkerboard boundary fence have been discussed by animal class throughout this alternative analysis.

Aquatic

Allowing livestock conversions without fencing of management use areas would be anticipated to result in the attainment of projected long-term conditions within a short-term timeframe. The conversions to cattle, combined with predominately season-long use, would be expected to create similar impacts and conditions as noted in the Chapter 3 aquatic wildlife analysis of Treatment A. Changes in habitat noted in TABLE 3-46 would result from season-long use. This alternative could be anticipated to reduce game fish populations as much as

70% and all fish populations by as much as 60% (TABLE 3-47).

As noted in Chapter 2, cursory field observations have indicated that aquatic habitat around 75% of the upland reservoirs is in a depressed or poor condition. In the absence of standing water inventory, quantification is lacking, but this alternative would be anticipated in the long term to establish a depressed to poor aquatic habitat condition on 100% of these areas (MAP 2-4).

Wild Horses

Increased competition between wild horses and cattle would result from the conversions allowed. Cattle use would be 40% in the Little Colorado Allotment; 60% in the Red Desert Allotment; 85% in the Bush Rim Allotment; and 20% in the Continental Peak Allotment. Cattle use has not occurred in the Continental Peak Wild Horse Management Unit (Continental Peak, Bush Rim, and Red Desert Allotments) in the past. These allotments have experienced only limited summer use by any class of livestock except the Bush Rim Allotment. Most of the use has been in the fall, and substantial nonuse has been taken in both wild horse management areas the past eight years (an average of 38% in the Little Colorado and 76% in the Continental Peak management area). The competition between wild horses and cattle should become insignificant as wild horse numbers would be reduced to management levels and adequate forage reservations (9,600 AUMs) would be made. This competitive factor should be reduced even more because of the ability of horses to travel farther from water to forage and to utilize more inaccessible areas.

The free-roaming nature of the wild horses would be enhanced because of the lack of fences. The additional cattle use and water developments could change the behavioral patterns of the wild horses and cause them to move into new areas. Since wild horses are presently grazing in areas that have season-long cattle use, it is anticipated that this would not be a significant impact. Quantification of this impact cannot be made until further studies are completed.

Cultural Resources

Increased livestock use (see livestock analysis) would lead to severe trampling in the Bar X, Fish Creek, Bush Rim, White Acorn, and Prospect Mountain Allotments. Trampling would cause the breakage of artifacts and their vertical and horizontal displacement through the churning of the sites' surface. See Chapter 3 cultural resources section for detailed discussion.

Anticipated sheet erosion (see soils analysis) over a period of 20 years would result in a 20 to 25% loss of archeological resources as sites would be gradually eroded, leading to a displacement of artifacts and the loss of other data vital to the interpretation or archeological sites.

The introduction of more livestock and their concentration under intensive management in various pastures at various times of the year would create a visual intrusion and detract from the prehistoric environment by the introduction of domestic animals. This would slightly decrease the public's experience and appreciation of the archeological and pre-1880 historical values.

Range Improvements

Impacts of the proposed water developments would be the same as discussed in Chapter 3 cultural resources. TABLE 8-45 shows the historic trails that would be impacted by the proposed checkerboard fence. They would receive severe visual impacts by the crossing of the fence as well as slight damage through construction.

Visual Resources

The visual effects of this alternative are site-specific and are related to water project developments, fencing, and concentrated trampling in stream bottoms and near water developments. These effects currently exist throughout the landscape. Change in the visual resource for the area, as a whole, would be negligible. Analysis of visual effects was accomplished by using the contrast rating system. The contrast ratings are shown on TABLE 2-65.

Recreation

Recreation experiences would change in quality in the Sandy area. The discussion of changes under Alternative 1 applies to this alternative. The impacts to visitor use days are shown on TABLE 8-46. They are based upon the same areas as defined in the proposed action. Shifts of boundary lines would have an insignificant effect upon visitor use figures by allotment and no effect upon the aggregate impact of this alternative on recreation.

TABLE 8-47 shows long-term visitor use days under Alternative 3. A detailed analysis is available for review upon request from the Rock Springs District Office.

A potential hazard from soil and waterborne diseases and parasites that are related to livestock grazing may occur to recreation seekers. It has not been quantified because of lack of data.

Wilderness Resource

Potential impacts to the wilderness resource would result from the proposed range improvements. Where these potential impacts exist, implementation of these components of the alternative would be postponed until the studies and public meetings required under the Federal Land Policy and Management Act (FLPMA) have been completed.

TABLE 8-45

HISTORIC TRAILS THAT WOULD BE IMPACTED BY THE PROPOSED FENCE UNDER ALTERNATIVE 3

Allotment	Trail
Steamboat Mountain	Point of Rocks-South Pass City Stage Road
Little Colorado	Bryan-South Pass City Stage Road
Little Colorado	Oregon Trail (two branches)

TABLE 8-46

PERCENT CHANGE IN VISITOR USE FROM EXISTING CONDITIONS UNDER ALTERNATIVE 3

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy/ Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	**Change in Percent Use**
Sand Dune Rally											0						0
Recreation Vehicle			0	0	0		0	0	0	0	0	0	0			0	0
Camping.Trailer	0	0	0	0	0	0		-20	-20	0		-20	0	0	0	-20	-5
Dry Camp.Tent	-18	0	0	0		0						+5	0	0	0	0	+1
Tent Camping	-5	0	0	0		0			-43			-20	0	0	-75	-78	-8
Picnic.Dry Camp	+38	0	0	0							0	0				0	+4
Picnic	-7	0	0	0					-30			-30		0		-28	-5
Camping.Camping Areas			0			0						-25	0	0		-25	-2
Picnic.Picnic Areas			0			0						-24	0	0		-24	-2
Hunting																	
Moose	0	0	0						-100			0	0	0	0		-8
Elk	0	0	-10	0	0			0		0	0	0	0	0	0	-10	-4
Deer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-25	+4
Antelope	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grouse			0	0					-37			0	0				-22
Sage Grouse	0	0	-5	0	0			-20		-20		-10	0			-25	-5
Dove			0		0					-29	-31			0	0	-50	-23
Goose/Duck						-50								0			-44
Cottontail						0											0
Rock Collecting	0			0	0	0		0	0	0				0			0
Fishing.Stream	0	0	-10	0					-79			-20	0	-33	0	-65	-10
Floatboat/Canoe	0	0	0	0		-30			-35			0	0	0	+200		+8
Fishing.Reservoir						0								0			0
Boating						0								0			0
Waterskiing						0								0			0
Swimming						0								0			0
Snowplay	0	0	0									0				0	0
Cross-Country Skiing			-11	0								0					-9
Snowmobile			0			0					+5	0					+3
Sightseeing Highway	0		0	0		0				0	0	0		0	0	+11	0
Sightseeing General	0	-40	-40	0	0	0	0	0	0	0	0	0	0	0		-41	-2
CHANGE IN ALLOTMENT USE	-1	-6	-5	0	0	-2	0	-9	-13	-3	0	-15	0	-1	+8	-12	-4

TABLE 8-47

PROJECTED VISITOR DAYS PER YEAR UNDER ALTERNATIVE 3

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy/ Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Total Visitor Days
Sand Dune Rally											3,700						3,700
Recreation Vehicle			360	803	278		805	68	35	233	248	315	713			15	3,873
Camping.Trailer	622	59	12,323	6,788	29	1,912		352	504	604		6,901	5,267	873	482	37	36,753
Dry Camp.Tent	32	4	770	424		106						567	329	56	30	3	2,321
Tent Camping	110	11	2,311	1,273		319			4			1,294	988	164	90	6	6,570
Picnic.Dry Camp	11	2	45	60							67	28				2	216
Picnic	67	18	405	540					21			176				13	1,340
Camping.Camping Areas			1,200			5,834						75	700	7,875		75	15,759
Picnic.Picnic Areas			544			66						34	337	51		34	1,066
Hunting																	
Moose	1	1	1						0			1	3	2	2		11
Elk	1	20	394	39	20			37		12	7	90	167	4	41	30	862
Deer	2	3	60	132	33	202	10	62	9	19	17	79	191	6	74	4	903
Antelope	3	5	4	11	12	82	236	28	46	13	21	3	2	3	6	1	476
Grouse			8	2					29			6	6				51
Sage Grouse	29	22	486	2,529	48			61		259		1,076	600			3	5,133
Dove			5		12					29	22			4	2	1	75
Goose/Duck						164								47			211
Cottontail						176					131						307
Rock Collecting	355			412	14	350		225	273	231				48			1,908
Fishing.Stream	30	34	5,126	3,590					9			3,190	2,628	550	500	12	15,669
Floatboat/Canoe	117	33	217	173		723			11			150	300	200	651		2,575
Fishing.Reservoir						6,911								758			7,669
Boating						1,100								248			1,348
Waterskiing						62								102			164
Swimming						132								8			140
Snowplay	56	56	222									28				139	501
Cross Country Skiing			92	2								20					114
Snowmobile			117			39					433	221					810
Sightseeing Highway	60		180	210		946				752	705	180		598	230	133	3,994
Sightseeing General	85	28	967	4,477	771	688	549	419	395	100	2,000	3,196	4,623	10,186		13	28,497
TOTAL USE BY ALLOTMENT	1,581	296	25,837	21,465	1,217	19,812	1,600	1,252	1,336	2,252	7,351	17,651	16,854	21,883	2,108	521	143,016

Livestock Grazing

Under this proposal there would be an initial reduction of 14,910 AUMs from 138,047 AUMs to 123,147 AUMs because of the conversion from sheep to cattle and forage allowances for wildlife and wild horses. Over the long term, the production of the range should decrease in four allotments: Little Colorado, Red Desert, Pacific Creek, and White Acorn (TABLE 8-43). This would require a further reduction in AUMs for livestock use. Those operators who are currently utilizing all of their active qualifications and not taking nonuse would have to reduce livestock numbers.

Those operators taking nonuse until they can convert from sheep to cattle could activate this nonuse with cattle. This would affect fourteen permittees and would allow these operators to increase their cattle herds, start cattle operations, and/or improve the efficiency of their year-round operations.

There would be increased maintenance costs to the permittees because of the additional water developments and the checkerboard boundary fence. A total yearly maintenance cost of $22,060 would be incurred by the ranchers for all projects that would be constructed (TABLE 8-48). Increased herding would be required to keep livestock within allotment boundaries and properly distributed over the range. This would mean increased operating costs to the cattle permittees.

The practice of herding to keep cattle within allotment boundaries and properly distributed could result in reduced weight gains if frequent movement of cattle occurs. As the forage would become less available, cattle would begin utilizing the meadow areas more intensively or would begin movement toward the home ranches or wintering areas. Thus, it would become increasingly more difficult to maintain cattle in the desired location. Increased herding would be required and reduced gains could occur at this time.

Farming

The allowance of conversion should not affect the present farming practices within the Sandy area. Increased local consumption of the hay produced in the Eden Valley could result. Presently 50% of the hay produced in the Eden Valley is utilized outside the area (Chapter 2 farming section).

Most of the cattle from livestock class conversions in the Red Desert, Pacific Creek, Steamboat Mountain, and Bush Rim Allotments would be wintered on checkerboard lands and would not make significant additional demands on the hay production in the Sandy area.

Socioeconomic Conditions

This alternative would have several income impacts by Year 23 of the project. AUMs available to livestock (private, State, and Federal) would decrease by 36,513 per year (TABLES 2-24 and 8-43), resulting in a loss of $773,163 in annual total income to the area.

Income from recreation activities would decline by $29,901 per year. (See the recreation analysis and Chapter 3 socioeconomic conditions section.)

Rancher maintenance would increase by $22,060 per year and BLM maintenance would increase by $16,435 per year. Construction projects would add $36,429 income per year for seven years during construction of range improvements. An unknown portion of this would remain in the Sandy area.

Rancher employment would decrease by seventeen jobs because of the conversions allowed in this alternative.

Impacts on resident attitudes and expectations would be similar to those of the proposal except that the open spaces would be preserved.

See APPENDIX 3E and the Chapter 3 socioeconomic conditions section for methodologies used in this analysis.

ALTERNATIVE 4-LIVESTOCK GRAZING PROGRAM AS PROPOSED BY THE SANDY OPERATORS

DESCRIPTION

Livestock operators who use national resource land in the Sandy area have proposed grazing management plans involving 28 allotments within the Sandy area (TABLE 8-49). The operator proposals include: endorsement of the proposed action on two allotments (existing AMPs); implementation of the same type of grazing system as the proposed action, with different methods or levels of implementation on three allotments; and a different system on 23 allotments. These totals assume the creation of ten additional allotments not included in the proposed action. The additional proposed allotments do not represent any significant adjustments in grazing use or privileges but are basically a recognition of traditional individual or group use areas. Allotment boundaries and individual use pastures are shown on MAP 8-4 located at the end of this chapter. Allotment boundaries in the Northeast Unit are essentially the same as those of the 1970 adjudication of that unit. The exceptions are that a new allotment, Bush Creek, is split out of Bush Rim Allotment as adjudicated, and Red Desert Allotment as adjudicated is divided into three allotments Red Desert, Red Lake, and Pinnacles. A new allotment, Waterhole Draw, is split out of the Poston Allotment as adjudicated. The operator proposals have been combined into similar categories by the Bureau for the purpose of analysis. The Sandy livestock operators' complete submission is available for review upon request from the Rock Springs District Office. A summary of each proposal by allotment is set out below.

Where the proposals of various operators differed for any particular area or allotment, the Bureau chose for impact analysis what appeared to it to be the most intensive management proposed on the assumption that the

TABLE 8-48

ANNUAL MAINTENANCE COST OF PROPOSED
RANGE IMPROVEMENTS UNDER ALTERNATIVE 3

Allotment	Rancher	BLM
1. Bar X	0	$ 80
2. Fish Creek	0	$ 40
3. Gold Creek	0	0
3a. Willow Creek	0	0
4. Little Sandy	0	$ 720
4a. Little Prospect	0	$ 640
5. Steamboat Mountain	$1,500	$ 230
6. Little Colorado	$11,500	$4,460
7. Red Desert	$2,460	$4,950
8. Bush Rim	0	$1,200
9. Continental Peak	0	$2,000
10. Pacific Creek	$650	0
11. Sands	$5,000	$555
12. White Acorn	0	$360
13. Prospect Mountain	$250	$520
14. Reservoir	0	$200
15. Poston	$450	$440
16. Pine Creek	$250	$ 40
TOTAL	$22,060	$16,435

TABLE 8-49

PROPOSED MANAGEMENT AND USE LEVELS BY ALLOTMENT UNDER ALTERNATIVE 4

Allotment and Acres	Grazing Systems	Class of Live-stock	Season of Use	Proposed Livestock Use in AUMs[1/]: Federal Land Use: Live-stock	Proposed Livestock Use in AUMs[1/]: Federal Land Use: Trail-ing Use	Proposed Livestock Use in AUMs[1/]: Author[2/] State & Private Land Use	Proposed Livestock Use in AUMs[1/]: Total Live-stock Use	Wildlife AUMs[3/]: Compet. Reserv. In AUMs[1/]	Wildlife AUMs[3/]: Total Allow. In AUMS[1/]	Wild Horse AUMs[3/]: Compet. Reserv In AUMs[1/]	Wild Horse AUMs[3/]: Total Allow. In AUMs[1/]	Total Forage Use In Area[4/] In AUMs[1/]
1. Bar X	Deferred	Cattle	06/01-10/15	355		437	792					
6,895	3-Pasture	Sheep	06/01-10/15	32		38	70					
		Horses	06/01-10/15	7		10	17					
		TOTAL		394	None	485	879	74	519	None	None	1,398
2. Fish Creek	Deferred	Cattle	05/16-08/15	657		231	888					
7,237	2-Pasture[6/]	TOTAL		657	None	231	888	6	55	None	None	943
3a. Gold Creek*	3-Pasture	Cattle	06/01-10/31	2,137		694	2,831					
24,580	Rotation	TOTAL		2,137	None	694	2,831	255	1,140	None	None	3,971
3b. Willow Creek*	Deferred by	Cattle	06/10-11/31	555		135	690					
5,945	Alternate	TOTAL		555	None	135	690	20	89	None	None	779
	Grazing											
4a. Little Sandy*	Herder	Cattle	05/01-10/16	6,485	8	984	7,477					
114,879	Controlled	Sheep	05/01-10/15		240	311	511					
	Rotation	TOTAL		6,485	248	1,295	8,028	870	5,744	None	None	13,772
4b. Little	Herder	Cattle	05/01-10/01	1,822	9		1,831					
Prospect	Controlled	Sheep	05/01-10/15	2,660	93		2,753					
67,748	3-Pasture	TOTAL		4,482	102	0	4,584	521	3,373	None	None	7,957
	Deferred											
5. Steamboat	Herder	Cattle	05/15-11/01	1,322		199	1,521					
Mountain	Controlled	Sheep	Spring/Fall		100		100					
38,276	2-Pasture	TOTAL		1,322	100	199	1,621	422	1,174	None	None	2,795
	Deferred											
6. Little Colorado*												
6a. Boundary	Herder	Cattle	05/01-12/26	340		41	381					
29,760	Controlled	Sheep	05/01-12/26	1,825		217	2,042					
	Rotation	TOTAL		2,165	None	258	2,423	54	264	None	None	2,687
6b. Buckhorn	Herder	Cattle	05/10-09/15	6,171		31	6,202					
100,350	Controlled	TOTAL		6,171	None	31	6,202	60	293	248	551	7,046
	2-Pasture											
	Deferred											
6c. Eden	Deferred	Cattle	05/10-10/31	2,896		101	2,997					
59,435	2-Pasture	Sheep			242		242					
		TOTAL		2,896	242	101	3,239	110	538	None	None	3,777
6d. Lombard	3-Pasture	Cattle	05/01-10/31	2,018			2,018					
73,670	Deferred	Sheep	05/01-12/15	1,200	390		1,590					
		TOTAL		3,218	390	0	3,608	48	235	None	None	3,843
6e. Sublette	Deferred by	Cattle	05/01-06/30	268		15	283					
78,520	Herding	Sheep	05/01-12/15	4,935		280	5,215					
		TOTAL		5,203	None	295	5,498	101	493	None	None	5,991
6f. Common	Season-Long	Cattle	05/01-02/28	6,053		27	6,080					
385,221		Sheep	10/15-12/15	15,200		66	15,266					
		TOTAL		21,253	None	93	21,346	298	1,456	431	1,249	24,051
7. Red Desert*												
7a. Pinnacles	Deferred	Cattle	10/01-12/15	970		38	1,008					
80,349	1-Pasture	Sheep	10/01-12/15	2,788		108	2,896					
		TOTAL		3,758	None	146	3,904	61	452	626	1,941	6,297
7b. Red Lake	Herder	Cattle	05/15-12/15	2,028		321	2,349					
36,784	Controlled	TOTAL		2,028	None	321	2,349	117	867	1,199	2,664	5,880
	2-Pasture											
	Deferred											
7c. Red Desert	Herder	Cattle	05/01-12/15	5,819		601	6,420					
132,024	Controlled	Sheep	05/01-12/15	2,475	94	270	2,829					
	Rotation	TOTAL		8,294	94	871	9,259	25	185	256	687	10,131
8. Bush Rim*												
8a. Bush Rim	Herder	Cattle	05/01-10/15	2,630	None	102	2,732					
76,322	Controlled	Sheep	05/01-10/15	542			542					
	3-Pasture	TOTAL		3,172	None	102	3,274	417	2,649	400	940	6,863
	Deferred											
8b. Bush Creek	Deferred	Sheep	10/20-12/10	1,316		90	1,406					
27,187	1-Pasture	TOTAL		1,316	None	90	1,406	69	438	104	385	2,229

TABLE 8-49 (Continued)

PROPOSED MANAGEMENT AND USE LEVELS BY ALLOTMENT UNDER ALTERNATIVE 4

Allotment and Acres	Grazing Systems	Class of Live-stock	Season of Use	Proposed Livestock Use in AUMs 1/: Federal Land Use Live-stock	Proposed Livestock Use in AUMs 1/: Federal Land Use Trail-ing Use	Proposed Livestock Use in AUMs 1/: Author 2/ State & Private Land Use	Proposed Livestock Use in AUMs 1/: Total Live-stock Use	Wildlife AUMs 3/: Compet. Reserv. In AUMs 1/	Wildlife AUMs 3/: Total Allow. In AUMs 1/	Wild Horse AUMs 3/: Compet. Reserv. In AUMs 1/	Wild Horse AUMs 3/: Total Allow. In AUMs 1/	Total Forage Use In Area 4/ In AUMs 1/
9. Continental	Season-Long	Cattle	05/01-12/15	1,100		200	1,300					
Peak*		Sheep	05/01-12/15	4,361	58	540	4,959					
89,914		TOTAL		5,461	58	740	6,259	213	1,085	377	1,183	8,527
10. Pacific	Herder	Cattle	05/01-12/15	4,913	5	499	5,417					
Creek*	Controlled	Sheep	05/01-12/13	5,471	235	563	6,269					
203,738	Selective	TOTAL		10,384	240	1,062	11,686	1,092	5,124	None	None	16,810
	Deferred											
11. Sands*	Deferred	Cattle	05/01-12/01	3,419		75	3,494					
112,051	2-Pasture	Sheep	11/01-12/01	558	100	13	671					
		TOTAL		3,977	100	88	4,165	550	2,508	None	None	6,673
12. White Acorn 6/	Combination:											
46,794	Rest Rotation	Cattle	06/01-10/15	2,286	7	782	3,075					
	3-Pasture &	Sheep	05/16-10/31	1,480	349	500	2,329					
	Alternate	TOTAL		3,766	356	1,282	5,404	217	1,279	None	None	6,683
	Grazing											
	2-Pasture											
13. Prospect	Herder	Cattle	06/01-10/31	1,536	11	340	1,887					
Mountain	Controlled	Sheep	05/01-12/31	1,373	207	183	1,763					
13a. Prospect	4-Pasture	TOTAL		2,909	218	523	3,650	396	2,947	None	None	6,597
Mountain	Deferred											
56,623												
13b. Buckskin-	Herder	Cattle	05/01-12/31	622		355	977					
Sandy	Controlled	Sheep	05/01-12/31	75		43	118					
8,710	2-Pasture	TOTAL		697	None	398	1,095	87	647	None	None	1,742
	Deferred											
14. Reservoir	Deferred by	Cattle	05/01-12/15	80		20	100					
35,545	Herding	Sheep	05/01-12/31	1,669		469	2,138					
		Horses	05/01-12/31	94		26	120					
		TOTAL		1,843	None	515	2,358	74	563	None	None	2,921
15a. Poston*	Herder	Cattle	05/01-12/15	542		81	623					
39,192	Controlled	Sheep	05/01-12/15	2,537	84	440	3,061					
	Rotation	Horses	05/01-12/15	98		16	114					
		TOTAL		3,177	84	537	3,798	105	887	None	None	4,685
15b. Waterhole	Seasonal	Sheep	05/20-07/15									
Draw	Grazing	Sheep	09/15-11/15	351			351					
11,443		TOTAL		351	None	0	351	19	160	None	None	511
16. Pine Creek*	Herder	Cattle	05/05-12/15	984		103	1,087					
14,089	Controlled	Sheep	05/05-12/15	249		26	275					
	3-Pasture	Horses	05/05-12/15	93		10	103					
	Deferred	TOTAL		1,326	None	139	1,465	15	140	None	None	1,605
TOTALS												
1,963,281				109,397	2,232	10,631	122,260	6,296	35,304	3,641	9,600	167,164

*Indicates an operator's desire to convert from a previously adjudicated class of livestock to that class as shown .

1/ An AUM is the amount of forage 1 cow, 5 sheep, 14.6 pronghorn, 5 deer, 1.5 elk, 1 moose, or 1 horse would eat in 1 month.

2/ This includes the state and private land AUMs that would be available as exchange of use (see Glossary).

3/ Competitive reservations are the portions of the livestock diets that overlap with those of wildlife and wild horse diets and which are needed to assure proper amounts of forage would be available for the numbers of wild animals expected in each allotment. Total allowance is the sum of these reservations and the additional forage available that wildlife and/or wild horses would use, but livestock would not use. Wild horse allotments represent enough forage for 800 animals for one year (800 X 12 = 9,600 AUMs), or the number of horses that are recommended for the area in the BLM's draft wild horse unit management plans. Wildlife allowances are based on the number of months each species would be expected in each allotment; numbers of animals are estimated from population data provided by the Wyoming Game and Fish Department at the time the AMPs were developed.

4/ Total forage use is the sume of the total livestock use and the total allowances for wildlife and wild horses.

5/ The 3,033 acres of Individual Use Pasture 34 is not included in the Little Prospect Allotment for this alternative. See TABLE 8-51, wildlife and wild horse competitive AUMs and total allowable AUMs have also been adjusted.

6/ Same management as proposed action (existing AMPs).

more intensive the system, the higher the likelihood of adverse environmental impacts resulting from the implementation of the system. All of the Sandy Livestock Users Association proposals share certain assumptions, as follows: (1) All Northeast Unit proposals made by the Association presume that wildlife and wild horse forage reservations would fall on the particular allotment actually used and that the licensed AUMs would be those of the 1970 adjudication. (2) The proposed allotments in the Little Colorado Unit assume that boundaries have been adjusted for such reservations. (3) Where positive movement dates are shown, it is assumed that such movement date is plus or minus five days, unless otherwise indicated, in order to adapt to the needs of the vegetation and the operator's desire for flexibility.

Under this alternative, wildlife and wild horse competitive forage reservations differ from the proposed action in that the operators have requested that the allotment boundaries be consistent with the adjudicated boundaries. This necessitated disproportionate adjustments in livestock use in order to maintain allotment boundaries. The allotment boundaries established for the proposed action were based on a proportionate adjustment in boundaries so no one group of operators would have to absorb large portions of the competitive forage reservations, thus reducing livestock AUMs. Nevertheless, the total competitive reservations and total forage allocations for this alternative would be the same as the totals for the proposed action, except for the adjustments made for the Buckskin-Sandy and entire Sandy (I-28) individual use pastures which would be part of the Prospect Mountain Allotment (TABLE 8-50).

Proposed range improvements are shown on TABLE 8-51 and MAP 8-5 located at the end of this chapter. Fencing proposals for the Bar X, Fish Creek, and White Acorn Allotments are the same as the proposed action. Bar X and Fish Creek have existing fences. The Steamboat Mountain, Red Desert, Bush Rim, and Continental Peak Allotments and portions of the Pacific Creek Allotment would be unfenced.

The operators have proposed that most interior pastures remain unfenced and that a 10% to 15% (depending upon the particular allotment) drift of livestock would be allowed between pastures of the same allotment. Interior pasture boundaries that would be unfenced include the Little Sandy, Little Prospect, Buckhorn, Sublette, Pacific Creek, and Prospect Mountain Allotments.

Many of the proposed developments shown were assigned tentative locations by BLM personnel. In most cases, these are the same as the proposed action. If Alternative 4 were to be implemented, the most current inventory data available would be used to determine the exact locations of improvements. Where it was determined that the improvements that would be required to implement an operator's proposal had not been adequately identified and analyzed in this statement, individual environmental assessment records (EARs) would be prepared for these proposed projects. Priorities for maintenance of existing range improvements would be established according to the needs of the resources.

Livestock use in unfenced allotments and pastures would be controlled by the operator through herding or supervised water control or a combination of the two. Proposed use of the area under this alternative would be approximately 47% sheep and 53% cattle. Herding remains the chief method of control for sheep. Of the proposed cattle use (58,008 AUMs), 12% (7,153 AUMs) would be in season-long management. The remaining 50,855 AUMs of proposed cattle use would be under some form of designated management. Most of this cattle use (72%) would be in unfenced pastures, requiring regular attention from operators to accomplish the objectives of proposed systems. Riding activities would be greatly increased.

Unfenced allotment boundaries would be marked with standard BLM allotment boundary signs. Mounted on grey fence posts, they would be located as shown on MAP 8-5 at locations that are easily visible (TABLE 8-51). Range supervision for this alternative would involve BLM employees making routine allotment inspections to insure that livestock numbers and time of grazing use of pastures comply with those proposed for each grazing system. Administrative actions related to unauthorized use (trespass) would be taken in accordance with BLM Manual 9230. Wildlife and wild horse use would be monitored to determine possible conflicts and solutions. The proposed livestock management for Alternative 4 is shown in TABLE 8-52.

The grazing systems proposed by the operators are varied and range from intensive to extensive. In the opinion of the Bureau and under its definitions, the proposals are generally variations of deferred grazing systems. Grazing systems, class of stock, seasons of use, level of livestock use, and wildlife and wild horse reservations by allotment are shown on TABLE 8-49. Eight treatments would be used in various combinations to make up the nine different grazing systems proposed for this alternative (TABLE 8-53).

This alternative includes proposed management of the individual use pastures that would be the same as Alternative 1 except for the adjustments made for the Buckskin-Sandy, Sandy (I-28), and I-34 pastures. Class of stock, season of use, and AUMs for individual use pastures are shown on TABLE 8-50. In order to give the reader an opportunity to consider the systems proposed, the systems will be briefly summarized allotment by allotment. The summary will first consider the allotments in the Northeast Unit in alphabetical order, and then those in the Little Colorado Unit in alphabetical order.

Northeast Unit

Bar X. The operator proposes to use the three existing fenced pastures as follows:

YEAR 1—Enter Pasture 1 with all livestock (whether sheep or cattle) on June 1; leave Pasture 1 and enter Pasture 2 with all livestock on July 15, plus or minus five days; leave Pasture 2 and enter Pasture 3 with all livestock on September 1, plus or minus five days; leave allotment approximately October 15.

TABLE 8-50

USE OF NRL IN INDIVIDUAL USE PASTURES UNDER ALTERNATIVE 4

Area	Acres Of NRL	AUMs From NRL	Class of Stock	Season of Use
I-1	170	6	Cattle	03/01 to 02/28
I-2	77	5	Cattle	05/01 to 12/15
I-3	144	16	Cattle	05/01 to 12/15
I-4	54	11	Cattle	05/01 to 12/15
I-5	297	20	Sheep	05/01 to 12/15
I-6	503	61	Horses	05/01 to 12/15
I-7	265	29	Horses	05/01 to 12/15
I-8	13	1	Cattle & Sheep	05/01 to 12/15
I-9	96	8	Cattle	06/01 to 10/31
I-10	71	6	Cattle	06/01 to 10/31
I-11	178	11	Cattle	05/15 to 09/15
I-12	66	9	Cattle & Sheep	05/03 to 10/31
I-13	13	5	Cattle & Sheep	05/03 to 10/31
I-14	16	2	Sheep	05/01 to 10/31
I-15	2,209	286	Sheep	05/01 to 10/31
I-16	96	23	Sheep	05/01 to 10/31
I-17	197	14	Cattle	10/01 to 10/31
I-18	120	11	Cattle	05/01 to 10/31
I-19	191	17	Horses	1/
I-20	3	1	Cattle	1/
I-21	1,094	125	Cattle	1/
I-22	19	4	Cattle	07/01 to 10/31
I-23	92	6	Cattle	07/01 to 10/31
I-24	1,197	83	Cattle & Sheep	05/05 to 12/31
I-25 Long Draw Pasture	2,153	270	Cattle	07/01 to 09/30
I-26 Grass Creek Pasture	1,677	208	Cattle	07/01 to 10/31
I-27	98	5	Cattle	05/01 to 09/30
I-28	1,389	180	Cattle	05/01 to 12/31
I-29	13	1	Cattle	05/01 to 10/31
I-30 Buck-skin Pasture	1,083	41	Cattle	07/01 to 09/30
I-31	537	75	Cattle	05/01 to 01/30
I-32	85	6	Cattle	05/01 to 01/31
I-33	8	1	Cattle	10/01 to 10/31
I-34	2,373	224	Sheep	05/01 to 10/31
TOTAL	16,597	1,771		

NOTE: This represents only the national resource lands in the individual use pastures. The pastures total 34,049 acres.

1/ The season of use for these three pastures varies on a two-year cycle from 07/06 - 08/12 for the first year and 08/13 - 09/10 for the second year. The cycle then repeats itself.

TABLE 8-51

ALTERNATIVE 4 - PROPOSED RANGE IMPROVEMENTS BY ALLOTMENT

	Water Developments						Fencing			Cattleguards			Allotment Boundary Markers	
	Reservoirs													
Allotment	Pit	Earth-fill	Wells	Springs	Miles of Pipe-line	Cost[1]	Miles of Three Strand	Miles of Four Strand	Cost[2]	Units	Cost at $1,600 Each	2-Track Vehicle Access (Miles)	Units	Cost at $2 Each
1. Bar X		3				$ 15,000							None	
2. Fish Creek													None	
3. Gold Creek								2	$ 5,000				None	
3a. Willow Creek								1	$ 2,500				None	
4. Little Sandy								30	$ 90,000	4	$ 6,400			
4a. Little Prospect								20	$ 50,000	3	$ 4,800		2	$ 4
5. Steamboat Mountain	3	2				$ 16,000				1	$ 1,600		5	$10
6. Little Colorado														
6a. Boundary			2			$ 50,000		5	$ 12,500			2		
6b. Buckhorn			3			$ 75,000		14	$ 35,000	3	$ 4,800	2		
6c. Eden			1			$ 25,000		16	$ 40,000	4	$ 6,400			
6d. Lombard			2			$ 50,000	18	26	$102,800	5	$ 8,000			
6e. Sublette			3			$ 75,000		16	$ 40,000	1	$ 1,600			
6f. Common			12		9	$322,500		49	$122,500	5	$ 8,000	1		
7. Red Desert														
7a. Pinnacles			2			$ 50,000							7	$ 14
7b. Red Lake			1			$ 25,000							4	$ 8
7c. Red Desert			4			$100,000							10	$ 20
8a. Bush Rim													10	$ 20
8b. Bush Creek			3	1		$ 78,000							6	$ 12
9. Continental Peak													5	$ 10
10. Pacific Creek							14	2	$ 34,400	2	$ 3,200		8	$ 16
11. Sands	11	1	1	3		$ 61,000	33		$ 69,300	5	$ 8,000	8		
12. White Acorn		9				$ 45,000		20	$ 50,000	7	$11,200	5		
13a. Prospect Mountain								12	$ 30,000	1	$ 1,600			
13b. Buckskin														
14. Reservoir	2	3				$ 19,000		6	$ 15,000	2	$ 3,200			
15a. Poston	3	3				$ 21,000		9	$ 22,500	2	$ 3,200			
15b. Waterhole Draw				1	2	$ 8,000		4	$ 10,000					
16. Pine Creek		1		1		$ 8,000		3	$ 7,500					
TOTALS	19	22	34	6	11	$1,043,500	65	235	$739,000	45	$72,000	18	57	$114

1/ Estimated costs are totaled for each allotment; unit costs are: springs, $3,000 (includes water fencing); wells, $25,000; reservoir (earthfill), $5,000; reservoir (pit), $2,000; pipelines, $2,500 per mile.

2/ Estimated costs of fencing are totaled for each allotment; unit costs are $2,100 per mile of three wire and $2,500 per mile of four-wire.

TABLE 8-52

PROPOSED LIVESTOCK MANAGEMENT UNDER ALTERNATIVE 4

	Acres	Total Livestock AUMs	Number of Areas
Allotment Management	1,963,281	122,440	28
Custodial Management	34,049	1,771	34
No Grazing	970	0	1
Federal Withdrawals	1,750	0	3
TOTAL	2,000,050	124,211	66

TABLE 8-53

PROPOSED GRAZING SYSTEMS UNDER ALTERNATIVE 4

System	Number of Allotments	Acres
Three-Pasture Rest-Rotation	1*	46,794
One-Pasture Deferred	3	118,979
Two-Pasture Deferred	7	362,843
Three-Pasture Deferred	5	238,724
Four-Pasture Deferred	1	56,623
Deferment by Herding	3	317,803
Alternately Grazed	1*	5,945
Rotation by Herding**	5	340,435
Season-Long Grazing	2	475,135
TOTALS	28*	1,963,281

* One allotment incorporates rest-rotation and alternately grazed systems on different portions.

**Livestock movements not keyed to any specific phenological requirements of plants.

YEAR 2—Enter Pasture 2 with all livestock on June 1; leave 2 and enter 3 with all livestock on July 15, plus or minus five days; leave 3 and enter 1 with all livestock on September 1, plus or minus five days; leave allotment approximately October 15.

YEAR 3—Enter 3 with all livestock on June 1; leave 3 and enter 1 with all livestock July 15, plus or minus five days; leave 1 enter 2 with all livestock September 1, plus or minus five days; leave allotment approximately October 15. Repeat sequence.

Buckskin-Sandy. The operator proposes to divide the allotment into two areas (pastures), a northeast area and a southwest area. Sheep and cattle would both use the area. Sheep use would be as follows:

YEAR 1—Sheep would enter northeast approximately June 16, leave allotment approximately July 10.

YEAR 2—Enter southwest approximately June 16, leave allotment approximately July 10; repeat cycle.

Cattle use would be as follows:

YEAR 1—Cattle enter northeast unit approximately July 1, held in northeast until approximately August 10, then allowed to distribute over entire allotment.

YEAR 2—Cattle would enter southwest unit approximately July 1, held in southwest until approximately August 10, then allowed to distribute over entire allotment.

Bush Rim. The operator proposes to divide the allotment into three approximately equal pastures. Use would be as follows:

YEAR 1—Enter 1 and 2 with all livestock (whether sheep or cattle) on May 1; stay in 1 and 2, enter 3 with all livestock on approximately August 1; leave allotment on approximately October 1.

YEAR 2—Enter 2 and 3 with all livestock on May 1; stay in 2 and 3, enter 1 with all livestock on approximately August 1; leave allotment on approximately October 1.

YEAR 3—Enter 3 and 1 with all livestock on May 1; stay in 3 and 1, enter 2 with all livestock on approximately August 1; leave allotment on approximately October 1; repeat sequence.

Bush Creek. The proposed use of the allotment is fall use by sheep. Sheep would enter the north end of the allotment approximately October 20 and be herded through the allotment in a southerly direction, leaving approximately December 10.

Continental Peak. The operators propose to continue their use as presently constituted. One user's present use is as follows: Enter the allotment with his licensed sheep on approximately June 1, leave allotment approximately July 10; reenter allotment on approximately October 1, and leave allotment on approximately November 15. The other operator in the allotment has applied for conversion in class of livestock from sheep to cattle and pending a decision has generally been taking nonuse. If the application for conversion is approved, the operator would propose a grazing plan consistent with the location of the two operators' respective private and leased lands within the allotment, with the differing classes of livestock use of the two operators and with the needs and requirements of the resources.

Fish Creek. The operator's plan is the same as the proposed action.

Gold Creek. The operator proposes to abandon the existing AMP. He would retain the present pasture boundaries and graze as follows: Begin and end grazing season in Sharp's Pasture. Dates would be determined by forage conditions and hunting seasons. Use Gold and Mill pastures during summer season, adjusting numbers and dates depending on forage and livestock requirements.

Little Prospect. Two proposals were made for this allotment by the operators, as follows:

For Sheep Management. Divide the allotment into five areas (pastures), and use as follows:

YEAR 1—Enter 1 and 2 on May 1 with all sheep; stay on 1 and 2 and enter 3 and 4, allowing drift, on approximately May 16, plus or minus five days; remainder leave 1 and 2 and enter 3 and 4 on approximately June 15, plus or minus five days; the remainder leave 4, stay on 3 and reenter 1 on approximately July 15, plus or minus five days; bulk of sheep go to National Forest at this time, but 400-700 head stay on 1 and 3, and all sheep reenter 2 and 4 on September 15, and then all sheep spread over all pastures, plus or minus five days; leave allotment on October 15.

YEAR 2—Enter 1 and 2 on May 1 with all sheep; stay on 1 and 2 and enter 3 and 4 on approximately May 16, plus or minus five days; leave 1 and 2 on approximately June 15, plus or minus five days; bulk of sheep leave 3 and go to National Forest, remainder stay on 4 and reenter 2 on approximately July 15, plus or minus five days; reenter 1 and 3 on approximately September 15 with all sheep, and then all sheep spread over all pastures, plus or minus five days; leave allotment on October 15. Pasture 5 is proposed as custodial pasture. Repeat sequence.

For Cattle Management. Divide allotment exclusive of Pasture 5 above into three areas. Use as follows:

YEAR 1—Enter 1 on May 1 with all cattle; leave 1, enter 3 with all cattle on approximately August 1 (not later than August 10); leave 3, enter 2 with all cattle on approximately September 15, plus or minus five days; leave allotment on October 1.

YEAR 2—Enter 2 on May 1 with all cattle; leave 2, enter 3 on approximate date of August 1 (not later than August 10) with all cattle; leave 3, enter 1 with all cattle on approximately September 15, plus or minus five days; leave allotment on October 1. Repeat sequence.

Little Sandy. The operator proposes to divide the allotment into five areas (pastures). The five-pasture system of the Little Sandy Allotment would utilize Individual Use Pastures 19, 20, and 21 as a single pasture under the grazing system in conjunction with the other pastures of the allotment. Management of these individual use pastures would be the same as Alternative 1; however, there would be two seasons of use (TABLE 8-49). Use as follows:

YEAR 1—Enter 1 with all livestock on approximately May 1; leave 1, enter 3 with all livestock on approximately June 10, plus or minus five days; leave 3, enter 5 with all livestock on approximately July 5, plus or minus five days; leave 5, enter 4 with all livestock on approxi-

mately August 12, plus or minus five days; leave 4, enter 3 with all livestock on approximately September 10, plus or minus five days; leave 3, enter 1 with all livestock on approximately September 20, plus or minus five days; leave allotment on October 15.

YEAR 2—Enter 2 with all livestock on approximately May 1; leave 2, enter 3 on approximately June 10, plus or minus five days; leave 3, enter 4 on approximately July 5, plus or minus five days; leave 4, enter 5 on approximately August 12, plus or minus five days; leave 5, enter 3 on approximately September 10, plus or minus five days; leave 3, enter 2 on approximately September 20, plus or minus five days; leave allotment on October 15. Repeat sequence.

Pacific Creek. The operator proposes that the following system be followed in the allotment. The use would be spring-summer-fall. At the beginning of each year, the operator and the area manager would review the area and after consultation, and in light of previous year's use, the condition of the forage and range, weather conditions, and other pertinent data would determine on what portion of the allotment to begin grazing for that year. Grazing (whether cattle or sheep) would be deferred on those portions of the allotment as necessary for the good of the range. For the purpose of analysis, this will be considered as a simple deferred system.

Pine Creek. The operator proposes that the allotment be divided into three areas (pastures). Use as follows:

YEAR 1—Enter 1 with all livestock (whether sheep or cattle) on approximately May 5, plus or minus five days; leave 1, enter 2 on approximate date of May 20, plus or minus five days; stay on 2, enter 3 on approximate date of August 1, plus or minus five days; leave 2 and 3, reenter 1 on approximate date of November 20, plus or minus five days; leave allotment on approximate date of December 15, plus or minus five days.

YEAR 2—Enter 1 with all livestock on the approximate date of May 5, plus or minus five days; leave 1, trail through 2, enter 3 with all livestock on the approximate date of May 20, plus or minus five days; stay on 3, enter 2 on the approximate date of August 1, plus or minus five days; leave 2 and 3, enter 1 with all livestock on the approximate date of November 20, plus or minus five days; leave allotment on the approximate date of December 15, plus or minus five days. Repeat sequence.

Pinnacles. This would be a new allotment in the Northeast Unit split out of the Red Desert Allotment as adjudicated. The allotment would be fall sheep and cattle use. The operators propose that the following plan be followed: Livestock (sheep and cattle) would go on the allotment on the approximate date of October 1, plus or minus five days, and would leave the allotment on December 15, plus or minus five days.

Poston. The operators propose that a new allotment be carved out of the Poston Allotment as adjudicated (see Waterhole Draw). The remainder of the allotment would be divided into two areas (pastures). An allotment, the Boundary Allotment, would be created in the Little Colorado Unit. Both the Poston Allotment and the Boundary Allotment would be managed under a joint venture. Two management plans are proposed as follows:

For Sheep Management.

YEAR 1—Enter 1 and 2 of Poston with all sheep on the approximate date of May 1; continue to use 1 and 2 of Poston and enter Boundary on the approximate date of May 25, plus or minus five days; continue to use 2 of Poston and Boundary, leave 1 of Poston on the approximate date of July 15, plus or minus five days; continue to use Poston 2 and Boundary, reenter Poston 1 on the approximate date of September 1; leave the allotment on the approximate date of December 15.

YEAR 2—Enter Poston 2 and Boundary Allotment with all sheep on the approximate date of May 1; continue to use Poston 2 and Boundary and enter Poston 1 on the approximate date of May 25, plus or minus five days; continue to use Poston 1 and Boundary, reenter Poston 2 on the approximate date of September 1, plus or minus five days; leave the allotment on the approximate date of December 15.

YEAR 3—Enter Poston 1 and Boundary with all sheep on the approximate date of May 1; continue on Poston 1 and Boundary and enter Poston 2 on the approximate date of May 25, plus or minus five days; continue on Poston 1 and 2, leave Boundary on the approximate date of July 15, plus or minus five days; continue to use Poston 1 and 2 and reenter Boundary on the approximate date of September 1, plus or minus five days; leave the allotment on the approximate date of December 15. Repeat sequence.

For Cattle Management.

YEAR 1—Enter Poston 1 and 2 with all cattle on the approximate date of May 1; leave Poston 1, continue on Poston 2 and enter Boundary on the approximate date of July 15, plus or minus five days; leave the allotment on the approximate date of September 15.

YEAR 2—Enter Poston 2 and Boundary on the approximate date of May 1 with all cattle; leave Poston 2, continue on Boundary and enter Poston 1 on the approximate date of July 15, plus or minus five days; leave the allotment on the approximate date of December 15.

YEAR 3—Enter Poston 1 and Boundary on the approximate date of May 1 with all cattle; leave Boundary, continue on Poston 1 and enter Poston 2 on the approximate date of July 15, plus or minus five days; leave the allotments on the approximate date of December 15. Repeat sequence.

Red Desert. The proposal of the users essentially suggests the creation of two new allotments within the Red Desert Allotment as adjudicated (see Pinnacles and Red Lakes). The following proposed management plan was made for the remainder of the Red Desert Allotment. The use in the allotment would be spring-summer-fall. At the beginning of each year the operators and the Area Manager would review the area and after consultation and in light of previous years' use, the present condition of the forage and range, weather conditions, and other pertinent data, would determine on what portion of the allotment to begin grazing for that year. Grazing (whether cattle or sheep) would be deferred on those portions of the allotment as necessary for the good of the

range. For the purpose of analysis, this will be considered as a simple deferred system.

Red Lake. Two proposals are made by the operator. Both are for either cattle or sheep, but each has a different period of use. In years during which the user was grazing sheep, the area adjacent to the shearing facilities at the Bar X Ranch would be used during the time of shearing and would not again be reentered during that grazing year. In years when the area was not being used for shearing, it would be used as a part of either of the management plans proposed.

The proposed plans are as follows:

Fall Use Management. Enter the allotment between the dates of September 1 and 15 with all livestock (whether cattle or sheep, except as set out above); leave allotment between the dates of December 1 and 15.

Summer-Fall Use Management.

YEAR 1—Enter the south portion of the allotment on approximately May 15 with all livestock, plus or minus five days; hold livestock to the south portion of the allotment until the approximate date of August 1, plus or minus five days, at which time grazing would be allowed throughout the allotment.

YEAR 2—Enter the north portion of the allotment on the approximate date of May 15, plus or minus five days, with all livestock (whether sheep or cattle, except as noted above); hold to the north portion of the allotment until the approximate date of August 1, plus or minus five days, at which time livestock would be released to use the entire allotment; leave allotment on the approximate date of December 15, plus or minus five days.

Sands. The allotment would be divided into two areas (pastures).

Cattle use would be as follows:

YEAR 1—The DeLambert cattle enter 1 at the north end on approximate date of May 1, and are held in the north portion until June 1, at which time the said cattle are released into the entire pasture, and Dearth-Jamieson and Chilton cattle enter 1 from the south on approximately May 1; leave 1, enter 2 on the approximate date of August 1, plus or minus five days, with all cattle, movement to be achieved in approximately 15 days; leave allotment on the approximate date of December 1, the DeLambert cattle removed north and the Jamieson and Chilton removed south.

YEAR 2—The DeLambert cattle enter 2 on approximately May 1 from north and are held in north portion of 1 until approximately June 1, at which time such cattle are released throughout 2, Jamieson and Chilton cattle enter 2 from south on approximately May 1; leave 2, enter 1 on approximate date of August 1, plus or minus five days, move to be achieved by the approximate date of August 15; leave allotment on approximate date of December 1, the DeLambert cattle removing north and Chilton and Jamieson cattle removing south from 1.

Sheep use would be as follows: Enter allotment after November 1 from the northwest into 1 and proceed through the allotment, as user desires, continuing through allotment and departing the allotment from the south into Rock Springs Grazing Association lands, on approximately December 1, it being presumed, but not required, that the sheep would use the area not being used by cattle.

Steamboat Mountain. The operator proposes to divide the allotment into two areas (pastures). Use would be as follows:

YEAR 1—Enter 1 with all livestock on the approximate date of May 15; continue in 1 and enter 2 on the approximate date of August 1, plus or minus five days; leave allotment on the approximate date of November 1.

YEAR 2—Enter 2 on the approximate date of May 15 with all livestock; continue in 2, enter 1 on the approximate date of August 1, plus or minus five days; leave allotment on November 1. Repeat sequence.

Prospect Mountain. The operator proposes to use herding and water control to accomplish a four-pasture deferred-rotation grazing system. Treatments would be as follows:

For Sheep Use. Herding would be used to graze two pastures until flowering, one of the remaining until seed ripe and the fourth from seed ripe until the end of the grazing season. Pattern would be varied to assure distribution of deferments on the basis of the greatest need.

For Cattle Use. Herding and water control would be used to control cattle use in a manner similar to that described above. If conflicts between sheep and cattle occupancy occurred, a more intensive system of cattle management which would approach a rest-rotation system would be employed.

Reservoir. The operator proposes to use herding to control grazing and to systematically rotate use in order to insure that all areas receive one year's deferment and one year's rest during the growing season every four years.

Waterhole Draw. The operator proposes that a new allotment be created out of the Poston Allotment. The following use is proposed. On approximately May 20, the operator will enter the allotment with his sheep and will lamb in the area; on the approximate date of July 14, plus or minus five days, the operator will remove his sheep from the allotment; between the dates of September 15 and October 5, the operator will reenter the area with his sheep and will remain on the allotment until the approximate date of November 15, at which time all sheep will be removed from the allotment.

White Acorn. The operator's proposal is the same as the proposed action.

Willow Creek. The operator proposes to manage this allotment in conjunction with his Atlantic City Allotment within the Lander Resource Area of the Rawlins District. Use would be as follows:

YEAR 1—Enter Atlantic City Allotment (Rawlins District) with all livestock on the approximate date of June 1, plus or minus five days; leave Atlantic City Allotment, enter Willow Creek Allotment on the approximate date of August 7, plus or minus five days, removal to be accomplished in approximately ten days from the move date; leave allotment on the approximate date of October 7, plus or minus five days.

YEAR 2—Enter Willow Creek Allotment (Rock Springs District) with all livestock on the approximate date of June 1; leave Willow Creek Allotment and enter Atlantic City Allotment with all livestock on the approximate date of August 1, plus or minus five days, movement to be accomplished in approximately ten days from the move date; leave allotments on October 7, plus or minus five days. Repeat sequence.

Little Colorado Unit

Boundary. See Poston Allotment under Northeast Unit.

Buckhorn. It is proposed that a new allotment, the Buckhorn Allotment, be created in the Little Colorado Unit. The allotment would be a private allotment. The user proposes that the allotment be located in the northwest portion of the Little Colorado Unit and that the allotment be divided into two areas (pastures). Use would be as follows:

YEAR 1—Enter 1 with all livestock on the approximate date of May 10, plus or minus five days; continue in 1, enter 2 on the approximate date of August 1, plus or minus five days; leave the allotment on the approximate date of September 15, plus or minus five days.

YEAR 2—Enter 2 with all livestock on the approximate date of May 10, plus or minus five days; continue on 2, enter 1 on the approximate date of August 1, plus or minus five days; leave the allotment on the approximate date of September 15, plus or minus five days; repeat sequence.

Eden. It is proposed by the operators that a new allotment be created within the Little Colorado Unit to be known as the Eden Allotment to be located in the southeast and east-central portion of the unit. The operators propose that the allotment be divided into two areas (pastures). Use would be as follows:

YEAR 1—Enter 1 with all livestock on approximately May 10, plus or minus five days; leave 1, enter 2 on the approximate date of August 1, plus or minus five days, movement to be accomplished within approximate date of October 31.

YEAR 2—Enter 2 with all livestock on the approximate date of May 10, plus or minus five days; leave 2, enter 1 with all livestock, on the approximate date of August 1, plus or minus five days, movement to be accomplished within approximately ten days after movement date; leave the allotment on the approximate date of October 31, plus or minus five days. Repeat sequence.

Lombard. It is proposed that the boundaries of the established allotment within the Little Colorado Unit known as the Lombard Allotment in the southwest portion of the Little Colorado Unit be adjusted to make the allotment of proper size to contain the licensed use of the two operators identified in the proposal. The operators propose that the allotment be divided into three areas (pastures). Use would be as follows:

YEAR 1—Enter 1 and 2 with all livestock (whether sheep or cattle) on May 1, continue in 1 and 2, enter 3 with all livestock on approximately August 1; leave allotment on applicable license date.

YEAR 2—Enter 2 and 3 with all livestock on May 1, continue in 2 and 3, enter 1 with all livestock on approximately August 1; leave allotment on applicable license date.

YEAR 3—Enter 3 and 1 with all livestock on May 1, continue in 3 and 1, enter 2 on approximately August 1; leave allotment on applicable license date. Repeat sequence.

Sublette. The operator proposes to use herding in the same manner as described in the Reservoir Allotment (same operator).

Common. It is proposed that the remainder of the Little Colorado Unit be designated an allotment to be known as the Common Allotment. Use in that allotment would be for fall sheep and for fall cattle, except as noted hereafter: The fall sheep use would be from approximately October 15, plus or minus five days, to December 15, plus or minus five days, and fall-winter cattle use would be from September 15, plus or minus five days, to February 28. The limited amount of existing summer cattle use would be allowed to continue for the operators presently holding such use within the unit. Such use would be restricted to the extreme west side of the allotment along the Green River, and the users would alternate use areas each year by water and herding control to effect a deferred use management system within that particular area. Wild horse reservations and use would be made within the Common Allotment.

ANALYSIS OF ALTERNATIVE 4 IMPACTS

Impacts on the existing environment's resources and land uses that would or could occur as a result of implementation of this alternative are analyzed in two stages; short term (eleven years following completion of this statement) and long term (23 years following completion of this statement). The analysis follows the same general pattern used to analyze the proposed action.

Soils

Sheet Erosion

Anticipated increases in total ground cover due to increased litter accumulation and plant vigor from implementation of the grazing systems proposed under this alternative (see vegetation analysis TABLE 8-62) would reduce the estimated sheet erosion rate in the Sandy area by 415,122 tons per year to a total of about 7,963,488 tons per year in 23 years (TABLE 8-54). Long-term reductions would vary in the proposed allotments depending upon the soil associations present. A detailed analysis by soil association in each pasture is available for review upon request from the Rock Springs District Office.

The Musgrave Equation was used to compute the changes in sheet erosion rates. These calculations depend largely upon the projected long-term increases in litter

TABLE 8-54

LONG-TERM SHEET EROSION UNDER ALTERNATIVE 4

Allotment	Acres	Geologic Erosion Tons/per/Year	Other Sheet Erosion Tons/per/Year	Total Erosion Tons/per/Year
Bar X	6,895	6,330	2,426	8,756
Fish Creek	7,237	6,643	5,529	12,172
Gold Creek	24,580	22,564	21,331	43,895
Willow Creek	5,945	5,457	6,161	11,618
Little Sandy	114,879	105,459	315,043	420,502
Little Prospect	67,748	62,193	156,633	218,826
Steamboat Mountain	38,276	35,137	616,856	651,993
Little Colorado				
Boundary	29,760	27,320	83,982	111,302
Buckhorn	100,350	92,121	172,679	264,800
Eden	59,435	54,561	110,715	165,276
Lombard	73,670	67,629	7,817	75,446
Sublette	78,520	72,081	165,461	237,542
Common	385,221	353,633	852,109	1,205,742
Red Desert				
Pinnacles	80,349	76,025	203,788	279,813
Red Lake	36,784	34,805	55,460	90,265
Red Desert	132,024	124,921	224,602	349,523
Bush Rim	76,322	69,557	684,888	754,445
Bush Creek	27,187	24,793	6,314	31,107
Continental Peak	89,914	83,625	604,363	687,988
Pacific Creek	203,738	188,371	894,485	1,082,856
Sands	112,051	95,028	403,978	499,006
White Acorn	46,794	42,957	104,390	147,347
Prospect Mountain	56,623	50,848	86,746	137,594
Buckskin	8,710	8,346	17,630	25,976
Reservoir	35,545	32,630	35,520	68,150
Poston	39,192	35,978	99,946	135,924
Waterhole Draw	11,443	10,505	42,591	53,096
Pine Creek	14,089	12,934	13,769	26,703
TOTAL	1,963,281	1,802,451	5,995,212	7,797,663

accumulation and canopy cover (TABLE 8-62) which were used to adjust the ground cover factor in the equation. APPENDIX 2B outlines how these calculations were made.

Mapping Units 132, 233, and 333 would continue to erode at high rates. Large areas of these soils are found in the Steamboat Mountain, Bush Rim, Continental Peak, and Pacific Creek Allotments. These mapping units are found on an estimated 95,000 acres in the Sandy area.

Large increases in total ground cover (TABLE 8-62) would be anticipated on allotments which have mapping units with sagebrush-grass vegetation (Bar X, Fish Creek, Gold Creek, Willow Creek, Buckhorn, Eden, Lombard, Sublette, Sands, White Acorn, Prospect Mountain, Buckskin, Reservoir, and Pine Creek Allotments). These units occur on about 72% (538,444 acres) of the allotments' total area.

Decreases in ground cover (TABLE 8-62) would be expected in this same type in the Red Desert and Continental Peak Allotments. Loss in total ground cover is also anticipated in meadow, saltbush-winterfat, and grass vegetation types in the same areas (TABLE 8-62); however, resulting increases in sheet erosion would be small due to gentle and nearly level slopes. Similarly, increases in these vegetation types in other allotments would result in minor reductions in erosion.

In allotments such as the Little Sandy, Little Prospect, Boundary, Common, Pinnacles, Red Lake, and Bush Creek, no measurable increase or decrease would be anticipated in sheet erosion. Exact amounts of increase or decrease for various mapping units are available for review at the Rock Springs District Office.

The guidelines for acceptable average erosion (Soil Conservation Service 1973) were used to determine the acres of erosion by class under this alternative. It was found that 492,790 acres would be in the excessive erosion category. This would be an increase of 73,156 acres over existing amounts in this class (TABLE 2-4). Light average erosion per pasture would occur on 348,458 acres, an increase of 218,215 acres over the present. The increase in acres under light and excessive sheet erosion would be reflected in the decreased average in the moderate category, down 295,666 acres to 1,122,099 acres (TABLE 8-55).

Erosion would increase in areas of construction of reservoirs and watering troughs. These areas would receive increased livestock and wildlife use. Animals would trample the vegetation and compact the soil. Construction at such sites would cause large areas of bare ground. Runoff and erosion from such areas would significantly reduce the life expectancy of reservoirs and pits if they are not maintained. Erosion from such areas would total 255 tons of sediment per year. This is an insignificant amount when compared to sheet erosion for the area, but it could be significant for the life expectancy of reservoirs and pits (see Chapter 3 soils section for method of calculation). Sheet erosion would continue to reduce water quality and impair aquatic habitat.

Wind Erosion

The impacts would be the same as discussed under Alternative 1.

Compaction

Using a technique similar to that used in Chapter 2 (APPENDIX 2D), the relative degree of expected use by livestock under this alternative in the short and long term was calculated. TABLE 8-56 shows acres of grazing intensity used (acres in the light, moderate, heavy, and severe intensity classes) by livestock would increase under this alternative from the current 918,463 acres (TABLE 2-6) to 1,025,980 acres over the short term and 1,056,888 over the long term (TABLE 8-56). This increased acreage would primarily be a result of increased available water that would be supplied by this alternative. Another factor of influence was an assumption that due to the increased animals per unit when grazing occurs, the livestock would travel farther from water. This assumption was based on the generally accepted and stated conclusion that grazing systems increase distribution and/or provide more uniform use (Stoddart, Smith, and Box 1975).

Another factor of influence would be the number of AUMs allocated for this alternative. Increased livestock use in some allotments would increase intensity and distribution; decreased use would decrease intensity and distribution. Exact amounts of acres within each intensity class by pasture are available for review upon request from the Rock Springs District Office.

The proposed grazing systems in the Red Desert, Continental Peak, and Waterhole Draw Allotments would cause 8,410 acres of soil in the severe and heavy intensity categories to receive season-long compaction every year. This would cause a reduction in infiltration rates, increased runoff and erosion, and a loss in soil productivity.

Livestock grazing intensity in the Bar X, Fish Creek, Gold Creek, Willow Creek, Little Prospect, Steamboat Mountain, Lombard, Pinnacles, Bush Rim, Bush Creek, and White Acorn Allotments would increase over the long term due to increases in AUMs used (TABLE 2-24 and 8-63). Grazing intensity in the Red Lake and Red Desert Allotments would decrease. Grazing intensity would remain unchanged in the Pacific Creek, Little Sandy, Boundary, Buckhorn, Eden, Sublette, Poston, Common, Continental Peak, Sands, Prospect Mountain, Buckskin, Reservoir, Waterhole Draw, and Pine Creek Allotments. There would be a total increase of 9,269 AUMs used in the Sandy area, which would result in a corresponding increase in grazing intensity in those allotments affected. However, decreases of AUMs used in those allotments presently most intensively grazed would result in less intensive use in the Sandy area-wide. Heavy and severe intensity classes would be reduced over the long term by 10,752 acres in those allotments where soil compaction would be expected to occur.

TABLE 8-55

ACREAGES OF EROSION BY CLASS UNDER ALTERNATIVE 4

Allotment	Light*	Moderate*	Excessive*
Bar X	6,895		
Fish Creek	7,237		
Gold Creek	24,580		
Willow Creek	5,945		
Little Sandy		84,962	29,917
Little Prospect		67,748	
Steamboat Mountain			38,276
Little Colorado:			
Boundary		29,760	
Buckhorn	50,261	50,089	
Eden	30,040	29,395	
Lombard	73,670		
Sublette	19,742	58,778	
Common		385,221	
Red Desert:			
Pinnacles		80,349	
Red Lake	20,760	16,024	
Red Desert		132,024	
Bush Rim			76,322
Bush Creek	27,187		
Continental Peak			89,914
Pacific Creek			203,738
Sands		57,488	
White Acorn		46,794	
Prospect Mountain	31,524	25,099	
Buckskin		8,710	
Reservoir	20,439	15,106	
Poston	16,089	23,109	
Waterhole Draw		11,443	
Pine Creek	14,089		
TOTAL	348,458	1,122,099	438,167

* Light - less than 2 tons per acre per year; Moderate - 2 to 5 tons per acre per year; Excessive - greater than 5 tons per acres per year. Detailed pasture level information is available upon request from the Rock Springs District Office.

TABLE 8-56

PROJECTED SHORT-TERM AND LONG-TERM ACRES OF GRAZING INTENSITY UNDER ALTERNATIVE 4

	Short-Term Mean					Long-Term Mean				
Allotment	Marginal* to Slight*	Light*	Moderate*	Heavy*	Severe*	Marginal* to Slight*	Light*	Moderate*	Heavy*	Severe*
Bar X	0	5,277	1,146	325	147	0	5,110	1,264	359	162
Fish Creek	0	5,617	1,156	322	142	0	5,400	1,311	365	161
Gold Creek	0	19,796	3,559	888	338	0	18,607	4,422	1,118	433
Willow Creek	2,287	3,147	380	95	36	1,458	3,824	486	126	51
Little Sandy	25,817	75,642	9,792	2,577	1,051	25,817	75,642	9,792	2,577	1,051
Little Prospect	28,937	30,910	5,778	1,511	612	26,551	31,779	6,860	1,813	745
Steamboat Mountain	21,634	14,569	1,581	366	126	17,046	17,873	2,561	592	204
Little Colorado										
Boundary	6,535	19,710	2,562	676	277	6,535	19,710	2,562	676	277
Buckhorn	72,249	15,643	8,947	2,453	1,058	72,249	15,643	8,947	2,453	1,058
Eden	24,842	29,098	3,960	1,076	459	24,842	29,098	3,960	1,076	459
Lombard	37,645	29,871	4,340	1,244	570	31,950	34,501	5,090	1,459	670
Sublette	39,949	28,212	7,308	2,093	958	39,949	28,212	7,308	2,093	958
Common	208,019	138,684	27,841	7,510	3,167	208,019	138,684	27,841	7,510	3,167
Red Desert										
Pinnacles	64,574	7,897	5,558	1,591	729	64,574	7,081	6,134	1,756	804
Red Lake	20,756	11,715	3,079	854	380	25,948	8,550	1,645	448	193
Red Desert	77,664	36,634	12,439	3,606	1,681	77,664	45,063	6,638	1,847	812
Bush Rim	41,854	29,898	3,439	829	302	33,355	37,135	4,365	1,070	397
Bush Creek	12,783	12,005	1,704	480	215	9,201	14,894	2,196	619	277
Continental Peak	41,209	37,438	8,286	2,135	846	41,209	37,438	8,286	2,135	846
Pacific Creek	80,572	104,710	13,486	3,536	1,434	80,572	104,710	13,486	3,536	1,434
Sands	70,914	35,704	4,092	985	356	70,914	35,704	4,092	985	356
White Acorn	14,587	24,106	5,809	1,599	693	4,066	32,102	7,631	2,091	904
Prospect Mountain	17,640	33,492	4,070	1,025	396	17,640	33,492	4,070	1,025	396
Buckskin	2,194	4,417	1,503	415	181	2,194	4,417	1,503	415	181
Reservoir	11,444	20,150	2,831	781	339	11,444	20,150	2,831	781	339
Poston	3,240	28,480	5,301	1,497	674	3,240	28,480	5,301	1,497	674
Waterhole Draw	7,946	2,970	385	101	41	7,946	2,970	385	101	41
Pine Creek	2,010	9,506	1,837	511	225	2,010	9,506	1,837	511	255
TOTALS 2/	937,301	815,298	152,169	41,081	17,432	906,393	845,775	152,804	41,034	17,275

*Marginal - Those acres generally too distant from water to be grazed.
Slight - Those acres within reach of water, but grazed at an intensity greated than 75 acres/AUM.
Light - Grazing intensity from 16 to 75 acres/AUM.
Moderate - Grazing intensity from 5.5 to 16 acres/AUM.
Heavy - Grazing intensity from 2 to 5.5 acres/AUM.
Severe - Grazing intensity less than 2 acres/AUM.

A detailed analysis of short-term grazing intensity at the pasture level is available upon request from the Rock Springs District Office.

2/ Totals by class will not total to exact acreages in allotments due to rounding inherent in method of calculation.

Water Resources

Water Use

Water consumption by livestock under this alternative would be 114 acre-feet per year during the first eleven years and 119 acre-feet per year at the end of the twenty-third year (TABLE 8-57). This would be an increase of 47 acre-feet per year in the long term and 42 acre-feet per year in the short term above existing water use levels (TABLE 2-7). This increase in consumptive use by livestock would be due to a proposed increase in AUMs.

Evaporation losses would increase by 157 acre-feet per year in 23 years due to the proposed 41 reservoirs and pits. Total evaporation loss by livestock reservoirs in the Sandy area would be 1,033 acre-feet per year at this time (TABLES 8-58 and 2-9).

Streamflow

Alternative 4 would have an unmeasurable effect on annual streamflow in perennial streams within or downstream from the Sandy area. Impacts related to streamflows are the same as Alternative 1.

Storm runoff from a ten-year event would increase 8% at the end of eleven years and 13% over existing levels in the Sandy area at the end of 23 years (TABLE 8-59). This increase would be due to decreased infiltration rates during season-long grazing and a projected long-term decrease in ground cover in some allotments (see vegetation analysis). Runoff was calculated using model basins as explained in Alternative 1.

Ten-year storm runoff from the Bar X, Fish Creek, Gold Creek, Little Sandy, Little Prospect, Bush Rim, White Acorn, Prospect Mountain, Poston, and Pine Creek Allotments would decrease below existing levels because of the decrease in acres in the severe, heavy, moderate, and light intensity of use classes (soils TABLE 8-56) and remain below existing levels at the end of 23 years (TABLE 8-59).

Runoff would increase above existing levels around proposed water developments. These areas are presently receiving little grazing use by livestock. Grazing intensity decreases as the distance from water increases (Mueggler 1965). Infiltration rates decrease as intensity of livestock use increases (Gifford and Hawkins 1976).

Water Quality

The proposed action would have no measurable effect on water chemical quality in perennial streams within the Sandy area or downstream. Sediment yield in the intermittent streams in the Sandy area would increase proportionally to the increase in storm runoff (TABLE 8-59). However, sediment transport would decrease on the allotments with a decrease in runoff in 23 years (TABLE 8-59). The PSIAC method (APPENDIX 2F) was applied to Alternative 4, and these calculations indicate there would be a 2% increase in sediment yield over the entire Sandy area. Total sediment yield would increase proportionally to the increased runoff around the proposed water developments due to increased acres in the severe, heavy, moderate, and slight intensity of use classes as indicated in TABLE 8-56.

It is estimated that all 22 earthfill type reservoirs would create some degree of headcutting and channel degradation during the project life if not maintained. The headcutting would increase sediment loads, thus degrading water quality (Chapter 3 water resources). Headcutting would occur when the maximum permissible velocities are exceeded.

Channel stability would generally decrease in the Sandy area. This is due to an increase in livestock grazing intensity along streams (TABLE 8-60). Channel stability would, however, increase in the Fish Creek, Gold Creek, Lombard, White Acorn, Prospect Mountain, and Reservoir Allotments (TABLE 8-61).

The concentration of dissolved solids would increase during runoff events in the intermittent streams within the Sandy area due to an increase in sediments from intermittent streams (Chapter 3 water resources). Salinity levels would increase on the allotments with an increase in runoff (TABLE 8-59) due to a projected increase in sediment yields. This effect would last for the life of the individual project. Salinity would increase below the proposed reservoirs due to headcutting if they were not maintained.

Fecal coliforms (indicators of bacteriological contamination) from livestock grazing on NRL would increase above existing levels due to an increase in grazing intensity. The Alternative 1 analysis applies to this alternative. Grazing intensity is functionally related to sources of fecal coliforms (feces). A change in fecal coliforms from livestock grazing on NRL may not be the only source affecting the concentration in perennial streams because of additional sources such as wildlife, man, and livestock grazing on private and State lands. However, no information is available to estimate the effects of livestock grazing on NRL on the existing concentration of fecal coliforms.

Vegetation

As stated in the description of this alternative, the majority of the grazing systems are a form of deferred grazing (one, two, three, or four pasture). These types of systems would be implemented in sixteen allotments (TABLE 8-53). Season-long grazing would occur in two allotments. One allotment would be alternately grazed with other lands outside the Sandy area, and eight allotments would have herder controlled systems employing planned deferment or rotation without respect to designated pastures. Five of these eight do not key livestock movements to specific phenological requirements of plants. TABLE 8-53 summarizes the proposed management systems for the Sandy area. TABLE 8-49 shows the specific management system, season of use, and class of livestock for each allotment.

TABLE 8-57

WATER USE BY LIVESTOCK, INCLUDING EXCHANGE OF USE, UNDER ALTERNATIVE 4

Allotment	Short Term in Acre-Feet*	Long Term in Acre-Feet*
Bar X	0.81	0.88
Fish Creek	0.82	0.91
Gold Creek	2.60	3.10
Willow Creek	0.63	0.77
Little Sandy	7.37	7.39
Little Prospect	4.21	8.50
Steamboat Mountain	1.49	2.14
Boundary	2.22	2.23
Buckhorn	5.69	5.71
Eden	2.97	2.98
Lombard	3.31	3.82
Sublette	5.05	5.06
Common	19.60	19.65
Pinnacles	3.58	3.92
Red Lake	2.16	1.26
Red Desert	8.50	8.50
Bush Rim	3.01	3.61
Bush Creek	1.29	1.61
Continental Peak	5.75	5.76
Pacific Creek	10.73	9.68
Sands	3.82	3.83
White Acorn	4.96	5.31
Prospect Mountain	3.35	3.36
Buckskin	1.01	1.01
Reservoir	2.16	2.17
Poston	3.49	2.89
Waterhole Draw	0.32	0.32
Pine Creek	1.35	1.35
Allotment Total	112.25	117.72
Individual Use Pastures**	1.46	1.46
Grand Total	113.71	119.18

* Based on use of 300 gallons per AUM.

** From national resource lands.

TABLE 8-58

EVAPORATION LOSSES IN ACRE-FEET BY THE PROPOSED RESERVOIRS AND PITS UNDER ALTERNATIVE 4

Allotment	Number of Proposed Pits	Reservoirs	Evaporation Losses in Acre-Feet Pits*	Reservoirs*	Total
Bar X	0	3	0	17.58	17.58
Steamboat Mountain	3	2	4.47	11.72	16.19
Sands	11	1	16.39	5.86	22.25
White Acorn	0	9	0	52.74	52.74
Reservoir	2	3	2.98	17.58	20.56
Poston	3	3	4.47	17.58	22.05
Pine Creek	0	1	0	5.86	5.86
	19	22	28.31	128.92	157.23

*Reservoir evaporation rate = 5.86 acre-feet/year and pit evaporation rate = 1.49 acre-feet/year (APPENDIX 2E).

TABLE 8-59

MODEL STORM RUNOFF IN ACRE-FEET BY ALLOTMENT UNDER ALTERNATIVE 4

Allotment	Existing	Short Term	Long Term
Bar X	1.5	1.6	0.5
Fish Creek	0.9	0.8	0.3
Gold Creek	19.8	18.9	13.7
Willow Creek	2.8	4.0	3.2
Little Sandy	64.3	62.7	62.7
Little Prospect	13.9	12.9	12.9
Steamboat Mountain	120.8	125.0	113.5
Boundary	14.7	24.0	24.0
Buckhorn	14.7	8.9	8.0
Eden	14.7	13.4	10.4
Lombard	14.7	51.3	42.5
Sublette	14.7	29.8	26.9
Common	14.7	12.1	12.1
Pinnacles	17.1	9.9	9.9
Red Lake	17.1	5.2	5.2
Red Desert	17.1	35.1	41.9
Bush Rim	66.9	62.4	56.3
Bush Creek	66.9	58.8	58.8
Continental Peak	82.9	83.4	104.2
Pacific Creek	58.2	58.2	58.2
Sands	2.0	28.6	24.5
White Acorn	12.8	13.7	10.7
Prospect Mountain	11.4	12.3	8.0
Buckskin	11.4	10.6	8.3
Reservoir	22.1	34.7	25.7
Poston	15.5	17.2	17.2
Waterhole Draw	15.5	8.8	8.8
Pine Creek	2.2	1.6	1.0
Weighted Mean	29.5	31.9	33.4
Percent Change		+8%	+13%

TABLE 8-60

RELATIVE GRAZING INTENSITY 100
YARDS FROM WATER UNDER ALTERNATIVE 4

Allotment	Existing*	Short Term*
Bar X	92	79
Fish Creek	65	74
Gold Creek	44	34
Willow Creek	44	12
Little Sandy	59	52
Little Prospect	59	45
Steamboat Mountain	7	7
Boundary	60	55
Buckhorn	66	83
Eden	60	61
Lombard	60	70
Sublette	60	84
Common	60	66
Pinnacles	3	89
Red Lake	3	64
Red Desert	3	86
Bush Rim	1	14
Bush Creek	1	68
Continental Peak	35	58
Pacific Creek	10	37
Sands	15	8
White Acorn	45	65
Prospect Mountain	42	28
Buckskin	42	89
Reservoir	67	57
Poston	49	70
Waterhole Draw	49	33
Pine Creek	35	50
Weighted Mean	38	59
Percent Change		+58%

*A relative intensity of 1 is the lowest intensity in the Sandy area and a relative intensity of 100 is the highest (APPENDIX 2D).

TABLE 8-61

PROJECTED CHANNEL STABILITY RATING UNDER ALTERNATIVE 4*

Allotment	Stream Miles	Present	Potential	23 years Future
Bar X	9.0	92	79	92
Fish Creek	5.5	92	84	87
Gold Creek	29.75	96	90	92
Willow Creek	9.25	98	93	91
Little Sandy	41.25	105	93	121
Little Prospect	2.00	102	94	111
Steamboat Mountain	9.5	110	89	119
Buckhorn	5.0	90	90	90
Common	33.25	96	93	101
Lombard	22.0	92	83	87
Continental Peak	6.25	99	79	108
Pacific Creek	48.0	107	92	113
White Acorn	22.75	96	81	95
Prospect Mountain	7.75	93	77	90
Buckskin	7.5	98	90	90
Reservoir	14.5	111	111	105
Poston	11.5	111	107	122
Waterhole Draw	11.5	111	107	123
Pine Creek	10.5	97	92	97
Total Miles	295.25			
Weighted Mean		100	90	103
Percent Change			-10%	+3%

*Channel Stability Rating	Condition
38	Excellent
39-76	Good
77-79	High Fair
96-114	Low Fair
115+	Poor

Vegetation Types

The overall type acreages for the Sandy area as shown on TABLES 2-13 and 2-14 would not be expected to change measurably under this alternative. The plant composition should be variable within each vegetation type. Invader species should be common to the meadow and grass types primarily in the sand dune area of the Sands Allotment. No vegetation type would be expected to be eliminated or completely changed within the 23-year long-term period.

Impacts by grazing system would be basically the same for all vegetation types. Site-specific instances would vary by vegetation type, grazing animal, elevation of the pasture or allotment, and the treatment sequence applied to the various grazing systems.

One-Pasture Deferred Grazing System. The one-pasture system affects the Pinnacles and Bush Creek Allotments (107,536 acres). The Pinnacles Allotment includes the sagebrush-grass, saltbush-winterfat, greasewood, and waste vegetation types; the Bush Creek Allotment includes the sagebrush-grass, saltbush-winterfat, meadow, and greasewood types.

This grazing system would involve a deferment of livestock grazing until the fall grazing season (October 1 to 20 of each year) with little change in class of livestock. An estimated 970 AUMs of cattle use in the Pinnacles Allotment would occur. No change in use would occur in the Bush Creek Allotment. Based on the amount of nonuse presently occurring in these two allotments, plant composition, ground cover, and vegetal cover would not be expected to change significantly over the long-term period, even with full active use as proposed (TABLE 8-62).

Forage Production. No significant change would be expected over the long term (TABLE 8-63) when compared to the present production figures (TABLE 2-24). Plant vigor would remain high since the vegetation would be allowed to store root reserves each year.

Range Condition and Trend

Three-Pasture Deferred System. This system would be applied to the Bar X, Bush Rim, Lombard, and Pine Creek Allotments and the cattle management of the Little Prospect Allotment. The system is described in Chapter 1 for the Bar X Allotment. Cattle and horses are the primary grazing animals with 92% of the use in the Bar X Allotment. Sheep use makes up the remaining 8%. Antelope and deer constitute the majority of the wildlife use. Treatments E, B, and D as described in Chapter 1 would be utilized by this grazing system and should allow plant vigor to maintain itself because of the rest provided either before or after grazing. Plant composition should not vary much from the present situation since the vigor of the existing vegetation would remain stable. An expected increase in litter accumulation in the long term should improve the ground cover from 48 to 60% (TABLE 8-62 and APPENDIX 2H) on the sagebrush-grass type. No change would be expected on the meadow type because this area receives the most intense livestock use. Vegetal cover should not change over the long term.

The Bush Rim Allotment would utilize Treatments A and C, where two pastures are grazed early with the total allotment opened for grazing around August 1 or seedripe date of the key forage species. Plant composition should remain constant in the vegetation types present as vigor should be maintained. No change is expected from the current conditions in the percent ground cover or vegetal cover (TABLE 8-62 and APPENDIX 2H). Grazing use would be primarily cattle. The Lombard Allotment would use Treatments B and E. Two pastures would receive Treatment E and one would receive Treatment B each year. Ground cover, vigor, and condition should improve slightly over the long term.

The Pine Creek Allotment would utilize Treatments B and E on two pastures in alternate years. When Treatment E is utilized, grazing is delayed two to three weeks in the spring and some light use continues after August 1. The remaining pasture is used for two to three weeks early each year and then grazed again in the late fall. Plant composition should not vary on the vegetation types as vigor should be maintained. Litter should increase as a result of the deferment, thus improving the ground cover from the present 56% to 62% on the sagebrush-grass type. No change is expected on the meadow type. Vegetal cover should remain approximately the same (TABLE 8-62 and APPENDIX 2H).

The Little Prospect Allotment would utilize one unfenced system for cattle (40% of the use) and another for sheep. The cattle plan would utilize Treatments B and E on two pastures with a third receiving Treatment B each year. The sheep plan would utilize herding to accomplish an alternating rotation grazing system not keyed to phenological requirements. Due to the present condition and nonuse, vegetal and ground cover should remain constant over the long term.

Forage Production. Long-term production for the Bar X Allotment should meet Class I qualifications (see Glossary and TABLE 8-63). Complete production data is available for review in the Rock Springs District Office. More than adequate forage would be produced for each grazing animal. A slight improvement in forage production would occur in the Bush Rim Allotment (TABLES 2-24 and 8-63), although it would not be significant to overall long-term use. Forage production would increase by approximately 20% (TABLES 8-49 and 8-63) in the Lombard Allotment. Long-term production in the Pine Creek Allotment would increase slightly (TABLES 2-24 and 8-62). Forage would increase by an estimated 15% in the Little Prospect Allotment (TABLES 2-24 and 8-63).

Range Condition and Apparent Trend. These factors should tend to improve over the long term for cattle, but remain about the same for sheep and wildlife in the Bar X Allotment. The majority of the acreage in the Bush Rim Allotment is in fair condition at present (TABLE 2-28), and it should remain about the same over the long term. Condition and apparent trend should remain stable or improve slightly for the Lombard and Little Prospect

TABLE 8-62

LONG-TERM AVERAGE PERCENT GROUND COVER AND VEGETAL COVER UNDER ALTERNATIVE 4

	Sagebrush Grass		Saltbush-Winterfat		Grease Wood		eadow		Grass		Perennial Forbs		Mountain Shrub		Conifer	
Allotments	% Ground Cover	% Vegetal Cover	% Ground Cover	% Vegetal Cover	% Ground Cover	% Vegetal Cover	% Ground Cover	% Vegetal Cover	% Ground Cover	% Vegetal Cover	% Ground Cover	% Vegetal Cover	% Ground Cover	% Vegetal Cover	% Ground Cover	% Vegetal Cover
Bar X	60+	17					94	30								
Fish Creek	46+	15					91	26								
Gold Creek	38+	17					73	25					87	18	78	9
Willow Creek	38+	17					73	25					87	18	78	9
Little Sandy	39	15					86	30					77	12		
Little Prospect	39	15					86	30					77	12		
Steamboat Mountain	56	11			56	12	60	22			16	6	79	18		
Little Colorado																
Boundary	25	17	23	15	28	11			27	23					27	12
Buckhorn	27	17	24	15	28	11			28	23					27	12
Eden	29	17	24	15	28	11	35	32								
Lombard	35	17	25	15	29	11	41	32								
Sublette	27	17	25	15	28	11			30	23						
Common	25	17	23	15	28	11			27	23					27	12
Red Desert																
Pinnacles	27	14	27	9	22	6			18	15	16	9				
Red Lake	27	14	27	9	22	6			18	15						
Red Desert	22	14	23	9	22	6			14	15	16	9				
Bush Rim	31+	13	44	11	14	16	97	18	19	15	17	12	67	19	78	9
Bush Creek	28	13	42	11	14	16	97	18	18	15						
Continental Peak	38	16	14	7	74	11	68	19	14	14	22	14	94	19		
Pacific Creek	40	14	68	6	22	21	82	17	47	12	11	12	94	16	76	11
Sands	32	15			14	12	65	23	34	16	11	12				8
White Acorn	62	16					89	29					53	14	78	11
Prospect Mountain	43	15					62	30					85	16	93	3
Buckskin	43	15					67	30								
Reservoir	38	12					59	28								
Poston	28	13					51	30								
Waterhole Draw	28	13					51	30								
Pine Creek	62	15					66	26								
Total Average	37	15	30	12	29	11	71	26	25	17	16	11	80	16	64	10

TABLE 8-63 (Cont'd)

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 4 BY ANIMAL CLASS IN AUMS AND POUNDS OF DRY WEIGHT FORAGE

Allotment	Cattle		Sheep		Wild Horses	
	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
9. Continental Peak	4,978,740 (6,383)	974,220 (1,249)	5,754,750 (7,673)	3,757,500 (5,010)	5,744,700 (6,383)	1,064,700 (1,183)
10. Pacific Creek	7,841,340 (10,053)	3,804,840 (4,878)	9,486,750 (12,649)	4,229,250 (5,639)	0 (0)	0 (0)
11. Sands	4,172,220 (5,349)	2,735,460 (3,507)	4,671,000 (6,228)	493,500 (658)	0 (0)	0 (0)
12. White Acorn	4,610,580 (5,911)	2,538,900 (3,255)	4,369,500 (5,826)	1,888,500 (2,518)	0 (0)	0 (0)
13. Prospect Mountain	3,410,940 (4,373)	1,421,940 (1,823)	3,745,500 (4,994)	1,370,250 (1,827)	0 (0)	0 (0)
13a. Buckskin-Sandy	777,660 (997)	762,060 (977)	770,250 (1,027)	88,500 (118)	0 (0)	0 (0)
14. Reservoir	1,341,600 (1,720)	139,620 (179)	1,773,000 (2,364)	1,634,250 (2,179)	0 (0)	0 (0)
15. Poston	1,858,740 (2,383)	489,060 (627)	2,548,500 (3,398)	1,881,000 (2,508)	0 (0)	0 (0)
15a. Waterhole Draw	575,640 (738)	0 (0)	732,750 (977)	263,250 (351)	0 (0)	0 (0)
16. Pine Creek	1,006,200 (1,290)	928,200 (1,190)	1,179,750 (1,573)	206,250 (275)	0 (0)	0 (0)
TOTALS	**96,746,520 (124,034)**	**57,509,400 (63,829)**	**101,873,250 (135,831)**	**42,110,250 (56,147)**	**46,161,000 (51,290)**	**8,640,000 (9,600)**

TABLE 8-63 (Cont'd)

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 4 BY ANIMAL CLASS IN AUMS AND POUNDS OF DRY WEIGHT FORAGE

Allotment	Antelope		Deer		Elk		Moose	
	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
1. Bar X	561,782 (697)	29,822 (37)	626,430 (1,330)	75,360 (160)	0 (0)	0 (0)	106,380 (197)	0 (0)
2. Fish Creek	807,612 (1,002)	36,270 (45)	1,047,504 (2,224)	75,360 (160)	0 (0)	0 (0)	359,100 (665)	19,440 (36)
3. Gold Creek	1,848,964 (2,294)	120,900 (150)	1,235,904 (2,624)	399,879 (849)	2,266,380 (4,197)	317,520 (588)	631,260 (1,169)	37,800 (70)
3a. Willow Creek	475,540 (590)	33,046 (41)	527,520 (1,120)	95,142 (202)	814,860 (1,509)	129,600 (240)	153,900 (285)	14,040 (26)
4. Little Sandy	9,533,368 (1,828)	471,510 (585)	9,728,505 (20,655)	1,377,675 (2,925)	2,077,380 (3,847)	990,360 (1,834)	792,180 (1,467)	96,660 (179)
4a. Little Prospect	5,952,310 (7,385)	294,996 (366)	6,074,958 (12,898)	860,517 (1,827)	1,328,400 (2,460)	1,031,400 (1,910)	697,140 (1,291)	84,780 (157)
5. Steamboat Mountain	1,912,638 (2,373)	137,020 (170)	1,964,070 (4,170)	98,439 (209)	1,979,640 (3,666)	72,900 (135)	0 (0)	0 (0)
6. Little Colorado: 6a. Boundary	1,875,562 (2,327)	95,914 (119)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
6b. Buckhorn	6,339,996 (7,866)	322,400 (400)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
6c. Eden	3,746,288 (4,648)	191,022 (237)	1,335,285 (2,835)	41,448 (88)	0 (0)	0 (0)	0 (0)	0 (0)
6d. Lombard	5,041,530 (6,255)	241,800 (300)	1,224,600 (2,600)	34,854 (74)	0 (0)	0 (0)	0 (0)	0 (0)
6e. Sublette	5,346,198 (6,633)	258,726 (321)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
6f. Common	24,389,560 (30,260)	1,239,628 (1,538)	2,598,507 (5,517)	58,875 (125)	0 (0)	0 (0)	0 (0)	0 (0)
7. Red Desert: 7a. The Pinnacles	4,292,756 (5,326)	162,812 (202)	297,201 (631)	81,954 (174)	1,520,640 (2,816)	96,120 (178)	0 (0)	0 (0)
7b. Red Lake	1,965,028 (2,438)	74,152 (92)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
7c. Red Desert	7,053,306 (8,751)	265,980 (330)	62,643 (133)	2,355 (5)	0 (0)	0 (0)	0 (0)	0 (0)
8. Bush Rim	4,464,434 (5,539)	255,502 (317)	3,180,663 (6,753)	118,221 (251)	4,966,920 (9,198)	194,940 (361)	0 (0)	0 (0)
8a. Bush Creek	1,591,044 (1,974)	91,078 (113)	0 (0)	0 (0)	419,580 (777)	16,200 (30)	0 (0)	0 (0)

TABLE 8-63 (Cont'd)

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 4 BY ANIMAL CLASS IN AUMS AND POUNDS OF DRY WEIGHT FORAGE

	Antelope		Deer		Elk		Moose	
Allotment	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
9. Continental Peak	5,691,972 (7,062)	270,010 (335)	4,712,826 (10,006)	379,155 (805)	3,104,460 (5,749)	108,000 (200)	0 (0)	9,180 (17)
10. Pacific Creek	7,962,474 (9,879)	744,744 (924)	8,760,600 (18,600)	227,022 (482)	4,728,780 (8,757)	434,160 (804)	72,900 (135)	53,460 (99)
11. Sands	5,285,748 (6,558)	270,010 (335)	6,337,305 (13,455)	128,583 (273)	5,663,520 (10,488)	222,480 (412)	21,060 (39)	0 (0)
12. White Acorn	3,245,762 (4,027)	188,604 (234)	3,435,945 (7,295)	756,426 (1,606)	1,885,140 (3,491)	466,560 (864)	1,084,320 (2,008)	51,480 (96)
13. Prospect Mountain	4,644,978 (5,763)	221,650 (275)	4,842,822 (10,282)	452,631 (961)	1,494,720 (2,768)	656,640 (1,216)	279,180 (517)	41,040 (76)
13a. Buckskin-Sandy	840,658 (1,043)	38,688 (48)	877,473 (1,863)	76,302 (162)	0 (0)	0 (0)	35,100 (65)	4,320 (8)
14. Reservoir	1,861,054 (2,309)	141,856 (176)	1,881,645 (3,995)	243,978 (518)	0 (0)	0 (0)	49,140 (91)	19,440 (36)
15. Poston	2,906,436 (3,606)	111,228 (138)	2,379,963 (5,053)	15,072 (32)	0 (0)	0 (0)	23,220 (43)	9,180 (17)
15a. Waterhole Draw	803,582 (997)	30,628 (38)	855,336 (1,816)	5,181 (11)	0 (0)	0 (0)	9,180 (17)	3,780 (7)
16. Pine Creek	1,179,178 (1,463)	41,106 (51)	689,073 (1,463)	79,128 (168)	187,380 (347)	41,040 (76)	257,040 (476)	19,440 (36)
TOTALS	127,422,958 (150,893)	6,373,042 (7,916)	65,618,778 (137,318)	5,683,557 (12,067)	32,437,800 (60,070)	4,777,920 (8,848)	4,571,100 (8,465)	464,040 (860)

Allotments. The Pine Creek Allotment's range condition and apparent trend should remain fairly constant, with a possible improvement over the long term toward good condition and an upward trend.

Two- and Four-Pasture Deferred Systems. Impacts to the vegetation types found in the allotments (TABLE 8-49) would be dependent upon whether the herding of livestock was successful where fences are not constructed to control the livestock (Herder Controlled Systems). Both grazing systems involve Treatments E and B or E, D, and B. The only advantage to the four-pasture deferred system would be a better distribution of livestock over a large area. If properly supervised they would be limited in movement by division fences or, where sheep are the dominant use, by herding on a strict pasture boundary line.

All vegetation types common to the Sandy area would be impacted by these deferred grazing systems. All classes of livestock and respective wildlife would be expected to graze on a portion of these allotments during a part of the year. Plant composition, ground cover, and vegetal cover should not vary to any great extent, although some slight changes could be evident in ground cover (TABLE 8-62 and APPENDIX 2H). This would be evident in the Buckhorn Allotment, where ground cover is relatively low. The deferment of use as proposed should improve the ground cover by 1 or 2%.

Those allotments proposed for the two- and four-pasture deferred systems (TABLE 8-53) should maintain their present forage production and realize a slight increase where proper distribution through water availability is provided. Plant vigor should be maintained, thus allowing for the maintenance of the current production level or the increased level mentioned above (TABLES 2-24 and 8-63). Ample forage production for this alternative's use would be available over the long term, although Class I qualifications would not be attained in most cases. Range condition and apparent trend should remain fairly constant over the long term since the waters that would be made available would provide for improved livestock distribution.

Season-Long Grazing. This includes the largest total acreage (475,135, TABLE 8-53) in the Sandy area of all grazing systems under Alternative 4. Substantial conversions from sheep to cattle occur on these allotments (TABLES 2-24 and 8-49).

In the short term there would be reduction in plant vigor, resulting in lowered forage production and less ground cover. Forage production and ground cover should stabilize in the long term at these lower levels. The cause of these impacts would be due to livestock concentrating near available water. Utilization would be expected to be 70 to 90% within a one-quarter to one mile radius of a water source; utilization would be 0 to 30% in the outlying areas. The impacts on range condition and trend would be similar to that of forage production.

Three-Pasture Rest-Rotation Grazing System. This system would be used on Pastures 1, 2, and 3 of the White Acorn Allotment. As described for the proposed action, this grazing system utilizing Treatments A, B, and C would provide sufficient rest to allow the vegetation to gain the needed height to withstand trampling and early use. Increased vigor gained by the other vegetation common to the meadow type through the rest period should further reduce grazing impacts on the willows. The undesirable shrub species in the meadow type should start to lose their regenerating ability as the more desirable plants gain vigor and better compete for space. Increased ground cover should result from increases in vegetation litter (TABLE 8-62 and APPENDIX 2H). Vegetal cover would not be expected to increase.

Forage Production. As a result of increased vigor from implementation of the grazing system, forage production would be expected to increase. Sufficient forage for wildlife would be reserved. Range condition and trend of the vegetation types common to these allotments should begin to improve, and over the long term they should attain fair to good condition with a static trend.

Seasonal Grazing. This system would be applied to the Waterhole Draw Allotment, where sheep use would occur for approximately 60 days in the spring and 60 days in the fall. Vegetation would have an opportunity to start growth prior to turning the sheep in around May 20. However, maximum vigor would not be attained as this grazing extends into the middle of July. Forage production is predicted to be approximately three times greater than the use planned for the allotment (TABLE 8-63).

The fall use should have very little effect on the vegetation since the growing period would have ended. Some impact to the willows in the meadow type may occur through trampling at this time of year when seeds are maturing; however, with sheep use prevalent in the area, this impact would be minimal. Plant composition should remain about the same as the present situation on both the sagebrush-grass and meadow types. Ground cover and vegetal cover are also predicted to remain the same over the long term (TABLE 8-62 and APPENDIX 2H). Range condition and trend should remain fair to static over the long term.

Two-Pasture Alternately Grazed System. This system would be applied to the Fish Creek Allotment and Pastures 4 and 5 of the White Acorn Allotment. Sagebrush-grass and meadow are the major vegetation types. Concentrated heavy use could occur on the meadows, primarily in the White Acorn Allotment, causing irreparable damage. Due to the rough topography, most of the livestock would use the stream bottoms.

Vigor could be difficult to maintain over the short term since it may take considerable time for the yearlong rest afforded a pasture to begin showing benefits. Ground cover would tend to decline over the short term, but it should improve in the long term. Vegetal cover would not be expected to change noticeably over the long term, but it may show a slight decrease during the short term. Plant composition should remain the same.

Forage production should increase in the long term to a point where 75% utilization could be allowed over the grazing season. During the short term, range condition for sheep and cattle and apparent trend should show de-

cline. An improvement should occur over the long term due to the rest afforded the pastures.

One-Pasture Deferred System. This system is applied to two allotments-Pinnacles and Bush Creek. This is a fall use only system with all use taking place after the growing season. Under this system cover, vigor, and production would improve over the long term.

Herder-Controlled Rotation and Selective Deferment by Herding. The use proposed for these allotments (TABLE 8-49) is not keyed to phenological requirements of plants. Good herding practices of both sheep and cattle could produce a more favorable plant response than would be expected under season-long grazing. TABLES 8-62 and 8-63 reflect these considerations. Ground cover would tend to decline over the short term, but it should improve in the long term. Vegetal cover would not be expected to change noticeably over the long term, but it may show a slight decrease during the short term. Plant composition should remain the same.

Threatened or Endangered Plants

The impacts would be the same as those described in Chapter 3. No detrimental effects should occur under this alternative.

Vegetation Production

The long-term production for cattle would be an estimated 125,151 AUMs; 137,237 AUMs were estimated for sheep; 51,290 AUMs for wild horses; 158,093 AUMs for pronghorn antelope; 139,318 AUMs for mule deer; 60,070 AUMs for elk; and 8,410 AUMs for moose (TABLE 8-64). Estimates were made using the same criteria explained in Alternative 1.

Range Improvements

The proposed water developments and fences would have the same impacts as those described in Chapter 3. Refer to that chapter for discussion of the impacts.

Wildlife

Terrestrial

Impacts from this alternative would affect the populations of the four major wildlife species in the Sandy area (pronghorn antelope, mule deer, elk, and moose) as well as sage grouse, waterfowl, nongame, and threatened and endangered species. The primary factors relative to the impacts on wildlife populations to be considered are food, water, cover, space, migration habits, and the conditions and availability of each factor. Projected populations are based on a summarized qualitative analysis of various elements outlined in the description of the alternative. A detailed analysis by critical element is available for review in the Rock Springs District Office.

Pronghorn Antelope. In the short term, current populations could decrease by 10% under normal conditions (approximately 950 animals) to between 8,600 and 8,700 animals following implementation of Alternative 4.

Food. Vegetation types used by antelope would not be expected to change as a result of implementation of this alternative. Forage production on the total Sandy area for pronghorn would be expected to increase approximately 10% over the long term (TABLE 8-64). Analysis of forage availability on the crucial winter habitat indicates that forage requirements for the wintering populations within each allotment where this habitat occurs (MAP 2-22) would be adequately satisfied, based on the Chapter 3 analysis and TABLE 3-24.

Cover. Based on the analysis of food adequacy for pronghorn on the Sandy area and the sagebrush-grass habitat showing no change in size, cover requirements should not be affected to any extent. The problems with the sheep-tight highway fences as discussed in Chapter 2 would continue. The proposed fencing of allotments with three- and four-strand wire would affect pronghorn movement during severe winters. The major areas of concern would be in the Little Sandy, Eden, Sublette, and Reservoir Allotments.

Water. The 81 new water developments would provide for improved distribution of livestock and wildlife over the total Sandy area. This would reduce utilization on areas where waters presently exist.

Space. This factor relates to the ability of a given animal to move throughout its habitat with a certain degree of ease. Movement within the Sandy area would be restricted by 300 miles of new fences of which approximately 80 miles would be in crucial winter habitat.

Migration. Present migration patterns would be altered by this alternative because of the new fences. Movement by pronghorn would be slowed as they migrated toward their crucial winter habitat.

Impacts from the proposed fencing on migrating pronghorn would be slight during most years; however, heavy losses of up to 45% of the base population could occur during a severe winter. Heavy losses were experienced during the winter of 1971-1972 when fencing was less extensive than as proposed in this alternative.

Mule Deer. The implementation of Alternative 4 could cause a reduction in the mule deer population. It would be expected to stabilize within the short-term period at between 2,850 and 4,400 animals.

Food. Vegetation types used by deer would not be expected to change with implementation of this alternative, and the condition of the range should remain about the same as at present in the long term. Forage production over the total Sandy area for mule deer would be expected to increase approximately 10% over the present (TABLE 8-64) in the long term. Analysis of forage availability on the crucial winter habitat indicates that forage requirements for the wintering populations within each allotment where this habitat occurs (MAP 2-23) would be adequately satisfied, based on the Chapter 3 wildlife section and TABLE 3-27.

Many of the water developments proposed in this alternative would be located on crucial winter habitat. These

waters would cause increased utilization by livestock and wildlife on these areas during the spring and summer. A potential shortage of mule deer winter forage could result from this situation.

Cover. Based on the analysis of food adequacy for mule deer on the Sandy area and the habitat types showing no change in size or condition, cover requirements should not be affected. The proposed fencing of allotments with three-and four-wire construction would affect mule deer movement to obtain adequate cover for survival, especially during severe winters.

Water. The 81 new water developments would provide for better distribution of livestock and wildlife. This situation would reduce utilization on present, adequately watered areas but increase utilization on many crucial winter areas as discussed in the food analysis above.

Space. The space factor would be changed by implementation of this alternative. The additional 300 miles of fence as proposed would reduce the ease of mobility for deer throughout the Sandy area.

Migration. Migrational patterns of mule deer are very isolated and involve less than 50% of the Sandy area. These migration patterns would be restricted by construction of planned fences and heavy losses up to 45% could be expected during a severe winter such as in 1971-1972.

Elk. The population of 1,165 elk would be expected to remain constant or possibly be reduced by 10% (approximately 100 animals) with implementation of this alternative.

Food. Vegetation types used by elk would not be expected to change in size to any significant degree with implementation of this alternative, and the condition of the range in the long term should remain about the same as at present. Forage production for elk over the total Sandy area would be expected to increase by approximately 10% over the present (TABLE 8-64) in the long term. Analysis of forage availability on the crucial winter habitat (Chapter 3 wildlife section and TABLE 3-30) indicates that forage requirements for the wintering elk population within each allotment where this habitat occurs (MAP 2-24) would not be adequately satisfied.

Many of the additional water developments proposed under this alternative would be located on crucial winter habitat. These waters would cause increased utilization by livestock and wildlife on these areas during the spring and summer seasons. A shortage of elk winter forage would be anticipated.

Cover. Based on the analysis of food adequacy for elk on the Sandy area and the habitat type showing no change in size or condition, cover requirements in general should be adequate. Access to the crucial winter habitat for necessary cover could be somewhat impaired during severe weather conditions due to the proposed fencing of allotments with three- and four-strand barbed wire fences. Elk losses attributable to these fences would be minor except during extreme weather conditions such as heavily crusted and deep snow. These conditions would contribute greatly to a weakened condition of the elk, which could cause them to have difficulty negotiating the fences.

Water. The 81 new water developments would provide for improved distribution of livestock and wildlife over the total Sandy area. This situation would reduce utilization on present, adequately watered areas but increase utilization on many crucial winter areas where forage reservations are already inadequate as discussed in the food analysis.

Space. Adequate space (freedom of movement to acquire the critical elements for survival) would be restricted by the 300 miles of new fence construction, portions of which occur in crucial winter habitat. Impacts to elk as a result of this fence have been described in the cover analysis.

Migration. The proposed allotment fences would impact elk in the manner described in the cover analysis. The degree of impact would be dependent upon the severity of the winter and the physical condition of the animals.

Moose. Current population levels as estimated by the Wyoming Game and Fish Department are approximately 23% (15 to 20 animals) below the current habitat carrying capacity. Implementation of this alternative would cause the moose population to stabilize at approximately 50 animals in the long term.

Food. Implementation of this alternative would not change any of the vegetation types making up moose habitat. Most of the allotments containing moose habitat also have considerable cattle use. However, total production for moose would not be expected to change over the long term (TABLE 8-64). Based on the current trend of the range condition a limited change would be expected.

Analysis of forage availability on the crucial winter habitat (Chapter 3 wildlife section and TABLE 3-32) indicates that its requirements for the wintering moose population would not be adequate in some allotments. Willow availability in these allotments would be one of the major problems.

Cover. Cover requirements pertinent to moose should be adequately meet even with a suspected shortage of forage in some of the allotments shown in TABLE 3-32. Population levels would not be high so cover should be adequate.

Water. Water requirements should be adequate as moose habitat is generally affiliated with wet meadow areas.

Space. Use levels on moose habitat by livestock should be reduced as a result of livestock reductions under this proposal; however, increased fencing in these areas would limit the space available to moose. Increased fencing in the moose habitat would also tend to restrict movement, but it would not significantly affect moose migration habits.

Sage Grouse. Current population levels are considered by the Wyoming Game and Fish Department to be at carrying capacity for the Sandy area. This alternative could cause a 1 to 5% increase in current populations.

Food and Cover. The sagebrush-grass type would be expected to slightly improve with implementation of this alternative and range condition should remain constant.

TABLE 8-64

PREDICTED LONG-TERM FORAGE PRODUCTION FOR MAJOR ANIMAL SPECIES IN THE SANDY AREA WITH IMPLEMENTATION OF ALTERNATIVE 4

Species	AUMs*	Animal Months Provided*	Pounds Available Dry Weight Forage
Cattle and Horses	125,151	125,151	98,617,780
Sheep	137,237	686,185	102,927,750
Wild Horses	51,290	51,290	46,161,000
Pronghorn Antelope	158,093	2,308,158	127,422,958
Mule Deer	139,318	696,590	65,618,778
Elk	60,070	90,105	32,437,800
Moose	8,410	8,410	4,541,400

*These figures represent the amount of production for each species in those areas which are considered suitable habitat or where management is proposed as is the case for wild horses.

Based on the food and cover analysis of the other game species common to this vegetation type, adequate forage and cover should be available for sage grouse to maintain themselves. Activation of nonuse could cause increased trampling on nesting areas.

Water. This requirement should improve because of the new waters planned under this alternative.

Waterfowl. Current populations (TABLE 2-51) are expected to vary an estimated 1 to 5% above present levels with implementation of this alternative.

Food. Impacts on food production and availability would be minimal when compared to the existing situation.

Cover. Potential increased trampling from cattle due to activation of nonuse could cause problems on the cover element for waterfowl. Increased vegetative production should limit much of this trampling impact on nesting habitat.

Water. Increased numbers of water developments should improve waterfowl habitat on the Sandy area by increasing nesting sites and places of rest in the long term.

Space. The adequacy of this element should not significantly change from the present situation, although increased cattle use could limit the amount of space which presently occurs.

Migration. The increased waters should attract more migrating birds into the area.

Nongame Species. Current populations would be expected to increase by an estimated 1 to 5% above normal levels (see Chapter 2 Wildlife, Nongame Species, for general discussion of populations) for both the short and long terms. Trampling impacts from livestock would be the primary source of damage to nongame species habitat.

Food. Activation of nonuse should not affect the forage availability for nongame species from that presently available because of the predicted 10% increase in forage production (TABLES 2-24 and 8-63).

Cover. A balance of forage availability would relate directly to adequate cover for all species in this classification. Activation of nonuse could cause increased trampling which could affect populations over the short term. Long-term impacts should be minimal as conditions stabilize due to vegetation production increases.

Water. Availability of adequate water should be improved over the current situation.

Space and Migration. These elements should not change under this alternative from the present situation except where excessive livestock trampling could occur.

Threatened and Endangered Species. Peregrine falcons, black-footed ferrets, and bald eagles are dependent upon the animal populations for food. The former two are especially dependent on nongame species as a food source and are impacted by the fluctuation in those population levels. The nongame population levels would not be expected to vary more than 5%; therefore, impacts to these three endangered species should be minimal. Projected increases in duck populations should improve chances for the peregrine falcon's continued survival.

Range Improvements

Water Developments. Impacts related to increased water developments (81) are discussed in previous sections of this analysis.

Fence Construction. Fencing of allotments as proposed under this alternative and impacts associated with these fences are discussed in previous sections of this analysis.

Aquatic

Under Alternative 4, the Sandy livestock operators' proposed program, aquatic habitat changes for the Bar X, Fish Creek, and White Acorn Allotments would be the same as portrayed for the short and long terms in TABLES 3-44 and 3-45. Management of these allotments would be the same as the proposed action. The remaining allotments would be anticipated to realize the estimated long-term habitat conditions (TABLES 3-44 and 3-45) within the short term. A detailed analysis is available for review upon request from the Rock Springs District Office. Implementation of deferred grazing systems with 10 to 15% drift between pastures would create the situation of season-long grazing in areas around aquatic habitat.

Livestock, cattle in particular, prefer to graze the most desirable areas and forage first. Deferred grazing, which provides only seasonal rest, would result in a situation wherein aquatic habitat areas would become the primary grazing areas within the allotment. This use and the effects of 10 to 15% drift would result in season-long grazing of riparian areas and the associated effects shown in TABLE 3-43. This alternative as proposed would be anticipated to have no direct benefits to aquatic habitat or fisheries within the Sandy area.

Wild Horses

The Little Colorado Wild Horse Management Unit would be the proposed Common Allotment. There are exterior boundary fences and additional water developments proposed in the allotment under this alternative. The Continental Peak Management Unit would include the proposed Pinnacles, Red Lake, Red Desert, Bush Rim, Bush Creek, and Continental Peak Allotments. No fences would be built in or between these allotments, but additional water developments are planned.

The impacts of grazing management and fences on the behavioral patterns and population dynamics of horses cannot be quantified until further studies are made. The following impacts could be expected. The grazing management on five of the allotments involve more than one pasture and would require restricting livestock to pastures. Concentration of the livestock could cause horses to move into areas farther from water. In all the allotments wells would be the primary source of water and livestock control could be accomplished with water and herding practices. In these cases water would not be available to horses except when livestock would be in the pastures. The wild horses then would have to com-

pete with livestock for space and forage in these pastures throughout the summer and use areas the livestock have not grazed in the past. The horses would still be able to move farther from water into areas not grazed by livestock. This would also cause increased competition among bands for forage, mixing of bands, and competition between stallions. Mixing of bands could be beneficial if this resulted in less inbreeding. Free movement would be restricted because of the lack of available water in the summer. Wild horses would be able to move freely in late fall and winter if snow were available.

The boundary fencing of the proposed allotments in the Little Colorado Management Unit would restrict the horses' range to the unfenced interior of the Common Allotment. Their free movement into presently familiar range would be restricted as a result of the proposed fencing until the horses became accustomed to their new habitat. The fences could still be a serious problem should the horses try to negotiate one of them or a cattleguard.

Cultural Resources

Under this alternative cattle use would be intensive in the Bar X and Fish Creek Allotments (see livestock grazing section). This use would lead to severe trampling in these allotments. Trampling would cause the breakage of artifacts and their vertical and horizontal displacement through the churning of a site's surface. See Chapter 3 for a more detailed discussion.

Over a period of twenty years, sheet erosion (see soils analysis) would result in a 2% loss of archeological resources on those soils which are particularly susceptible to erosion. Those soils constitute about 26% of the Sandy area. Sites would be gradually eroded, leading to a displacement of artifacts and the loss of other data vital to the interpretation of archeological sites.

Range Improvements

The impacts of the proposed water developments on the cultural values would be the same as discussed in the Chapter 3 cultural resources section. Fence crossings of historic trails would be a severe visual intrusion on the natural setting of the trail, thereby diminishing the experience of individuals who visit the trail. The trail itself could be damaged by the construction of the fence using the methods referenced in the introduction to Chapter 8 and described in Chapter 1. The construction of a fence across a trail would also harm the trail's eligibility for inclusion on the National Register of Historic Places. The historic trails listed in TABLE 8-65 would be crossed by fences under this alternative and would be impacted in the manner discussed above.

Visual Resources

The visual effects of this alternative are site-specific and are related to water developments, fencing, and concentrated trampling in stream bottoms and around water developments. For the most part, these effects currently exist throughout the landscape. Change in the visual resource for the area would be very minimal in most instances.

The contrast ratings for this alternative would be the same as TABLE 3-58 with the following exceptions: The reservoirs noted on TABLE 3-58 for the Continental Peak Allotment in the Honeycomb Buttes Landscape Type are not proposed in this alternative. The contrast rating shown in the footnotes of TABLE 3-58 is correct for this alternative.

Range Improvements

A well, pipeline, trough, and trampling would affect the vegetation in the Boars Tusk and Boars Tusk Sand Dunes Landscape Type within the Sands Allotment. These activities also add structures which conflict with the natural character of the landscape. The proximity of this development to a well-traveled road makes these features highly visible. The area as a whole may be considered to be affected to a lesser degree than shown on TABLE 3-58.

Aesthetics

The visual quality of the Sandy area would decline in the eyes of a segment of the population because of the introduction of additional fencing. The visual effect of fencing is very minimal; nonetheless, a public reaction could be anticipated because of the desire by many for wide-open spaces. This reaction is less a matter of aesthetics than a reflection of the values of the local population.

The aesthetic impact of fencing is considered negligible except where a foreign vertical element such as a fence post is highlighted against the sky disrupting the natural lines of the ridges. Because of the limited access and the density of fencing proposed in the Sandy area, this situation would rarely be observed.

Recreation

Recreation experiences would change in quality in the Sandy area. The Alternative 1 discussion of changes applies to this alternative.

The impacts shown on TABLE 8-66 are based upon the same areas as defined in the proposed action. Shifts of boundary lines would have an insignificant effect upon the visitor use figures by allotment and no effect upon the aggregate impact of this alternative on recreation. An exception is the Lombard Allotment which would improve slightly more than figures for the Little Colorado Allotment indicate. The net effect of the improvement within the Lombard Allotment would be insignificant due to the low density of recreation use in this area.

TABLE 8-65

HISTORIC TRAILS THAT WOULD BE IMPACTED
BY PROPOSED FENCES UNDER ALTERNATIVE 4

Allotment	Trail	Location
Little Sandy-Little Prospect	Oregon	S. 26, T. 27 N., R. 103 W.
	Lander Cutoff	S. 8, T. 29 N., R. 103 W.
	Lander-Pinedale Stage Road	S. 26, T. 28 N., R. 103 W.
Little Colorado	Oregon Trail	S. 16, T. 24 N., R. 107 W.
	Oregon Trail	S. 19, T. 23 N., R. 108 W.
	Oregon Trail	S. 6, T. 22 N., R. 108 W.
	Oregon Trail	S. 4, T. 22 N., R. 109 W.
	Sublette Cutoff	S. 9, T. 26 N., R. 107 W.
	Sublette Cutoff	S. 5, T. 26 N., R. 109 W.
	Sublette Cutoff	S. 8, T. 26 N., R. 111 W.
	Slate Creek Trail	S. 26, 27, 28, T. 24 N., R. 110 W.
	Slate Creek Trail	S. 9, T. 23 N., R. 109 W.
	Kinney Cutoff	S. 9, T. 23 N., R. 111 W.
	Bryan to South Pass City Stage Road	S. 15, 9, 24, T. 23 N., R. 107 W.
Prospect Mountain	Lander Cutoff	S. 3, T. 29 N., R. 105 W.
Reservoir	Sublette Cutoff	S. 8, T. 26 N., R. 105 W.

TABLE 8-66

PERCENT CHANGE IN VISITOR USE FROM EXISTING CONDITIONS UNDER ALTERNATIVE 4

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy-Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Change in Percent Use
Sand Dune Rally											0						0
Recreation Vehicle			0	-70	0		0	0	0	0	0	-40	-40			0	-25
Camping.Trailer	0	0	0	0	+59	0		0	-20	0		0	+25	+60	0	0	+4
Dry Camp.Tent	-18	0	+11	0		0						+11	-5	-5	-43	0	+5
Tent Camping	-5	0	0	-5		+19			-43			-5	+25	+237	-74	0	+4
Picnic.Dry Camp	+38	0	+11	0							+10	+11				0	+8
Picnic	-7	0	0	0					-30			0		+75		0	+4
Camping.Camping Areas				0		0						0	+33	+650		0	+319
Picnic.Picnic Areas				0		0						0	+33	+651		0	+41
Hunting																	
Moose	0	0	0						-100			0	+67	+100	+50		+25
Elk	0	0	-10	-10	+10			0		0	0	-10	-10	0	0	0	-30
Deer	0	0	0	-10	+12	0	0	0	0	0	0	-10	-10	+17	0	0	0
Antelope	0	0	0	-9	0	0	0	0	0	0	0	0	0	0	0	0	0
Grouse			0	-50					-37			0	0				-26
Sage Grouse	0	0	+19	-5	+42			-20		-20		+25	+12			0	+5
Dove			0		+25					-29	-31			+50	+50	0	-16
Goose/Duck						-35								+30			-27
Cottontail						0											0
Rock Collecting	0			0	0	0		0	0	0				0			0
Fishing.Stream	0	0	-10	-10					-79			0	+125	+78	+100	-9	+20
Floatboat/Canoe	0	0	+5	-15		-24			-35			-1	+11	-7	+168		+5
Fishing.Reservoir						0								+11			+1
Boating						0								0			0
Waterskiing						0								+13			+8
Swimming						0								0			0
Snow Play	0	0	0									0				0	0
Cross-Country Skiing			-11	0								-25					-13
Snowmobile			-5			0					0	-14					-5
Sightseeing Highway	0		0	0		0				0	0	0		0	0	+11	0
Sightseeing General	0	-40	-40	-40	+11	0	0	0	0	0	0	-25	-25	-11		-41	-19
TOTAL USE	-1	-6	-4	-14	+11	-1	0	-1	-13	-3	-2	-3	+23	+235	+30	0	+35

TABLE 8-67 shows visitor use for this alternative and the relative effect of this alternative upon the various recreation activities. A detailed analysis is available for review upon request from the Rock Springs District Office.

Fences would add to the hazard of snowmobiling, floatboating, and cross-country skiing. The incidence of fences in Alternative 4 would not be extreme in that they would not be prevalent in the areas where these activities are most common, hence few accidents should occur.

A hazard that is related to livestock grazing from soil and waterborne diseases, including parasites, may occur to recreation seekers. The hazard is potential, and it has not been quantified because of lack of data.

Wilderness Resource

Potential impacts to the wilderness resource would be the range improvements proposed under this alternative. Where these potential impacts exist, implementation of these components of the alternative would be postponed until the studies and public meetings required under the FLPMA have been completed.

Livestock Grazing

Impacts on Permittees

Under this alternative, there would be an initial reduction of 28,650 AUMs from the present active qualifications of 138,047 AUMs to 109,397 AUMs (TABLE 8-49). The long-term production would increase in ten of the allotments with the proposed grazing systems. The production on thirteen allotments would remain the same over the long term. A decrease in production would occur on five allotments in the long term. The predicted long-term production and use is shown in TABLE 8-63.

Those allotments with proposed grazing management without fences (MAP 8-4) would require increased livestock supervision, resulting in increased handling costs to the permittees. Some control of livestock could be accomplished with water to keep them confined within the proposed pastures. Construction of the proposed fences and water developments would cause the permittees to expend an additional maintenance cost of $52,890 annually (TABLE 8-68).

Impacts on Livestock

The concentration of cattle in pastures within seventeen of the allotments proposed under this alternative should increase the probability of a cow's being serviced. This concentration should also force cattle to more uniformly utilize the pastures, grazing unpalatable as well as palatable forage species. This would give the more desirable plants a chance to compete ecologically in the plant communities. As the more desirable and palatable grasses gain vigor and increase production during the long term, improved livestock performance such as calf weights and condition of livestock at end of grazing season should result.

Livestock rate of gain could temporarily decrease when a change in pasture causes a change in diets to more mature forage. If livestock (especially cattle) are herded into the pastures, this would also cause a temporary reduction in weight gains until they adjust to the new grazing areas (Hormay 1970).

In those allotments with pasture fences (MAP 8-5), cattle would tend to congregate where fences cross drainages or natural movement paths trying to get to traditional use areas or from lower to higher elevation areas as forage becomes less available. The cattle would mill about or trail along the fence. This would waste energy that could be used in weight gains and/or body condition. After the first year, this problem should be eliminated because the cattle would be used to their new areas (Johnson 1965).

The proposed water developments should improve the distribution of livestock. Livestock would be able to graze areas previously unavailable. Livestock should spend less time traveling to forage, thus more food could be converted to milk for the young or to weight gains.

Farming

The impacts on farming would be the same as those identified for Alternative 3. There would be no significant changes in the farming practices other than some increased local demands for hay.

Socioeconomic Conditions

This alternative would have several income impacts by Year 23. AUMs available to livestock (private, State, and Federal) would decrease by 30,312 per year (TABLES 2-24 and 8-63), resulting in a loss of $641,857 in annual total income to the area.

Income from recreation activities would increase by $168,876 per year (see recreation analysis and Chapter 3 socioeconomic conditions section). Rancher maintenance would increase by $52,890 per year, and BLM maintenance would increase by $11,495 per year. Construction projects would add $270,500 per year for seven years during construction of range improvements. An unknown portion of this would remain in the Sandy area.

Rancher employment would decrease by ten jobs because of the conversions allowed in this alternative. Impacts on resident attitudes and expectations would be similar to those of the proposal. See APPENDIX 3E and the Chapter 3 socioeconomic conditions section for methodologies used in this analysis.

TABLE 8-67

PROJECTED VISITOR DAYS PER YEAR UNDER ALTERNATIVE 4

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy-Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Total Visitor Days
Sand Dune Rally											3,700						3,700
Recreation Vehicle			360	241	278		805	68	35	233	248	189	428			15	2,900
Camping.Trailer	622	59	12,323	6,788	46	1,912		440	504	604		8,626	6,584	1,397	482	46	40,433
Dry Camp.Tent	32	4	856	424		106						599	312	53	17	3	2,406
Tent Camping	110	11	2,311	1,209		379			4			1,536	1,235	553	95	9	7,452
Picnic.Dry Camp	11	2	50	60							74	31				2	230
Picnic	67	18	405	540					21			252		175		18	1,496
Camping.Camping Areas			1,200			5,834						100	933	59,063		100	67,230
Picnic.Picnic Areas			544			66						45	449	383		45	1,532
Hunting																	
Moose	1	1	1						0			1	5	4	2		15
Elk	1	20	394	35	22			37		12	7	81	150	4	41	30	834
Deer	2	3	60	119	37	202	10	62	9	19	17	71	172	7	74	4	868
Antelope	3	5	4	10	12	82	236	28	46	13	21	3	2	3	6	1	475
Grouse			8	1					29			6	6				50
Sage Grouse	29	22	607	2,402	68			76		259		1,527	670			4	5,664
Dove			5		15					29	22			6	3	2	82
Goose/Duck						212								62			274
Cottontail						176					131						307
Rock Collecting	355			412	14	350		225	273	231				48			1,908
Fishing.Stream	30	34	5,126	3,231					9			3,987	5,913	1,466	1,000	31	20,827
Floatboat/Canoe	117	33	228	147		790			11			149	333	187	581		2,576
Fishing.Reservoir						6,911								842			7,753
Boating						1,100								248			1,348
Waterskiing						62								115			177
Swimming						132								8			140
Snowplay	56	56	222									28				139	501
Cross Country Skiing			92	2								15					109
Snowmobile			111			39					411	189					750
Sightseeing Highway	60		180	210		946				752	705	180		598	230	133	3,994
Sightseeing General	85	28	967	2,686	857	688	549	419	395	100	2,000	2,397	3,467	9,054		13	23,705
TOTALS	1,581	296	26,054	18,517	1,349	19,987	1,600	1,355	1,336	2,252	7,336	20,012	20,659	74,276	2,531	595	199,736

TABLE 8-68

ANNUAL MAINTENANCE COSTS OF PROPOSED RANGE IMPROVEMENTS UNDER ALTERNATIVE 4

	Rancher	BLM
1. Bar X	0	$120
2. Fish Creek	0	0
3. Gold Creek	$320	0
3b. Willow Creek	$160	0
4a. Little Sandy	$6,400	$60
b. Little Prospect	$3,200	$45
5. Steamboat Mountain	$300	$215
6. Boundary	$800	$400
Buck Horn	$2,240	$1,245
Eden	$3,710	0
Lombard	$6,860	$75
Sublette	$2,560	$1,215
Common	$11,540	$1,275
7. Pinnacles	0	$800
Red Lake	0	$400
Red Desert	0	$1,600
8a. Bush Rim	$300	0
b. Bush Creek	$250	$1,200
9. Continental Peak	0	0
10. Pacific Creek	$2,420	$30
11. Sands	$4,950	$555
12. White Acorn	$3,200	$465
13a. Prospect Mountain	$1,920	$15
b. Buckskin	0	$640
14. Reservoir	$640	$230
15a. Poston	0	$270
b. Waterhole Draw	$640	$350
16. Pine Creek	$480	$290
TOTAL	$52,890	$11,495

ALTERNATIVE 5-REDUCTION OF GRAZING CAPACITY ON ALLOTMENTS WHERE EXCESSIVE SOIL EROSION AND POOR LIVESTOCK RANGE CONDITION EXIST

DESCRIPTION

Under this alternative the level of grazing systems management of livestock use would be 74,613 AUMs (TABLE 8-69). The proposed level of use on NRL would be 63,982 AUMs which is approximately 18% less than the existing actual use of 77,887 AUMs (average of the 1974-75 actual NRL use shown in TABLE 2-70). This would be a 54% reduction from the allowable adjudicated use of 138,047 AUMs (TABLE 2-70) and a 44% reduction from the proposed action Federal livestock use of 114,885 AUMs, including trailing use (TABLE 1-4).

The level of use of each allotment (TABLE 8-70) was determined by developing two map overlays outlining the excessive soil erosion and poor range condition (see Glossary) areas for sheep and cattle. These overlays are available for review in the Rock Springs District Office. The AUMs of vegetation production were then determined for these areas. Livestock grazing on all allotments would be reduced for this alternative. The existing average 74-75 actual use of 77,887 AUMs was used as the base from which the reductions were made. Operators would be allowed to convert from the present sheep use to cattle use at the same ratio as with the proposed action but at a level reduced by elimination of livestock use from areas of excessive erosion and poor range condition. The nonuse of adjudicated qualifications that has been authorized for the Sandy area would be licensed as suspended nonuse (see Glossary). This nonuse would continue for the short term (eleven years) or until the monitoring studies (Chapter 1) indicate that sufficient forage is available to increase use.

AUMs that had been reduced could be restored over the long term up to a maximum of 35,864. This could provide 99,846 AUMs of livestock use at the end of 23 years (TABLE 8-80). The availability of these AUMs would be predicated on the amount of improvement in the range. This would be based on additional studies to monitor the range condition and trend, forage production, erosion condition, and sedimentation.

The level of use by livestock would be reduced to reflect reservations for wildlife and wild horses the same amount as the proposed action (TABLE 8-70). The allotment boundaries, grazing systems, class of stock, and seasons of use would be the same as those in the proposed action (TABLE 8-70). Fencing and water developments would be the same as the proposed action (TABLE 1-13 and MAP 1-3) except for the elimination of 9 miles of pasture fence in the Steamboat Mountain Allotment. This fence would not be needed since this alternative would reduce the AUMs that would be available under the proposed action by 1,274 AUMs (75%) from 1,710 AUMs (TABLE 1-4) to 436 AUMs.

ANALYSIS OF ALTERNATIVE 5 IMPACTS

Impacts on the existing environment's resources and land uses that would or could occur as a result of implementation of this alternative are analyzed in two stages: short term (eleven years following completion of this statement) and long term (23 years following completion of this statement). The analysis follows the same general pattern used to analyze the proposed action.

Soils

Sheet Erosion

Anticipated increases in ground cover from implementation of this alternative (see vegetation analysis) would decrease the estimated sheet erosion rate in the Sandy area in both the short and long term. It would be reduced by 811,601 tons per year to approximately 7,567,009 tons per year in the short term. In the long term, it would be the same as the proposed action (see TABLE 8-71). The short-term reduction would represent the only anticipated reduction in sheet erosion for any alternative, including the proposed action.

The Musgrave Equation was used to compare the changes in sheet erosion rates. These calculations depend largely upon the projected long-term increases in litter accumulation and canopy cover (TABLE 8-42) which were used to adjust the ground cover factor in the equation. APPENDIX 2B outlines how these calculations were made.

Mapping Units 132, 233, and 333 would continue to erode at high rates. Approximately 88,630 acres of these soils are found in the Steamboat Mountain, Bush Rim, Continental Peak, and Pacific Creek Allotments. A detailed analysis by soil association in each pasture is available upon request from the Rock Springs District Office.

The guidelines for acceptable average erosion by allotment (Soil Conservation Service 1973) were used to determine the acres of erosion by class under this alternative. It was found that 373,414 acres would remain in the excessive erosion category of more than 5 tons per acre per year in the long term (TABLE 8-72). This is 19% of the acres on which improved management procedures would be implemented. These allotments have large areas of Mapping Units 132, 233, and 333 (TABLE 2-3 and MAP 2-3). These mapping units would be expected to continue to erode at high levels.

Moderate erosion would occur on 1,098,560 acres. This is 56% of the acres on which improved management procedures would be implemented and is a reduction of 319,205 acres or 23% from the present situation of 1,417,765 acres (TABLE 2-4). The reductions in acres under the excessive and moderate sheet erosion classes are reflected in a 280% increase in the light erosion category acreage from 130,333 acres (TABLE 2-4) to 495,758 acres (TABLE 8-71).

TABLE 8-69

PROPOSED LIVESTOCK MANAGEMENT UNDER ALTERNATIVE 5

	Acres	Total Livestock AUMs	Number of Areas
Allotment Management	1,967,730	74,613	16
Custodial Management	29,600	1,325	33
No Grazing	970	0	1
Federal Withdrawals	1,750	0	3
TOTAL	2,000,050	75,938	53

TABLE 8-70

PROPOSED MANAGEMENT AND USE BY ALLOTMENT UNDER ALTERNATIVE 5

Allotment and Acres	Grazing Systems	Class of Live-stock	Season of Use	Proposed Livestock Use in AUMs[1/]: Federal Land Use At Start of Program[2/]	Federal Land Trail-ing Use	Authorized State & Private Land Use	Total Live-stock Use	Wildlife[4/]: Compet. Reserv. In AUMs[1/]	Total Allow In AUMs[1/]	Wild Horses[4/]: Compet. Reserv. In AUMs[1/]	Total Allow In AUMs[1/]	Proposed[5/] Total Forage Use in AUMs[1/]
1. Bar X 6,895	Deferred 3-Pasture	Cattle	06/01-10/15	279		437	716					
		Sheep	06/01-10/15	32		38	70					
		Horses	06/01-10/15	6		10	16					
		TOTAL		317	None	485	802	74	519	None	None	1,326
2. Fish Creek 7,237	Alternately Grazed 2-Pasture	Cattle	05/16-08/15	583		231	814					
		TOTAL		583	None	231	814	6	55	None	None	869
3.*Gold Creek 30,525	Alternately Grazed 4-Pasture	Cattle	06/01-10/31	2,275		829	3,104					
		TOTAL		2,275	None	829	3,104	275	1,229	None	None	4,333
4.*Little Sandy-Little Prospect 185,660	Combination Alternately Grazed 2-Pasture & Rest-Rotation	Cattle	05/16-10/31	7,143		984	8,127					
		Sheep	05/16-10/05	2,945		311	3,256					
		Dual	Spring		210		210					
			Fall		184		184					
		TOTAL		10,088	394	1,295	11,777	1,391	9,117	None	None	20,894
5. Steamboat Mountain 40,537	Deferred	Cattle	05/01-12/15	137		199	336					
		Sheep	Fall		20		20					
		TOTAL		137	100	199	436	481	1,344	None	None	1,780
6.*Little Colorado:Green River Use Area 303,791	Rest-Rotation 3-Pasture	Cattle	05/01-01/31	6,435	On Demand	94	6,529					
		Sheep	05/01-11/30	2,689		30	2,719					
		TOTAL		9,124		124	9,248	143	725	272	1,008	10,981
*Farson Use Area 205,123	Rest-Rotation 3-Pasture	Cattle	05/01-06/30	59	On Demand	6	65					
		Sheep	05/01-12/15	7,847		547	8,394					
		TOTAL		7,906		553	8,459	195	937	214	792	10,188
*Big Sandy Use Area 218,042	Rest-Rotation 3-Pasture	Cattle	05/16-10/31	2,121	On Demand	28	2,149					
		Sheep	06/01-12/15	6,278		73	6,351					
		TOTAL		8,399		101	8,500	333	1,617	None	None	10,117
7.*Red Desert 245,375	Rest-Rotation 3-Pasture	Cattle	05/01-12/15	1,934		923	2,857					
		Sheep	11/01-12/15	920		415	1,335					
		Dual			146		146					
		TOTAL		2,854	146	1,338	4,338	144	1,067	1,967	5,277	10,682
8.*Bush Rim 104,547	Rest-Rotation 3-Pasture	Cattle	05/01-12/15	332		102	434					
		Sheep	07/10-12/15	343		90	433					
		Sheep			276		276					
		TOTAL		675	276	192	1,143	313	1,988	503	1,340	4,471
9.*Continental Peak 88,478	Rest-Rotation 3-Pasture	Cattle	05/01-12/15	664		200	864					
		Sheep	05/01-07/15	858		215	1,073					
		Sheep	07/16-10/15	352		81	433					
		Sheep	10/16-12/15	990		244	1,234					
		Dual			58		58					
		TOTAL		2,864	58	740	3,662	194	998	384	1,183	5,843
10.*Pacific Creek 202,856	Rest-Rotation 3-Pasture	Cattle	05/01-12/15	2,122		499	2,621					
		Sheep	05/15-10/31	2,617		563	3,180					
		Sheep			240		240					
		TOTAL		4,739	240	1,062	6,041	1,074	5,120	None	None	11,161
11.*Sands 114,852	Rest-Rotation 3-Pasture	Cattle	05/01-12/15	1,357		75	1,432					
		Sheep	11/01-12/15	361		13	374					
		Dual			100		100					
		TOTAL		1,718	100	88	1,906	508	2,304	None	None	4,210

TABLE 8-70 (Cont'd)

PROPOSED MANAGEMENT AND USE BY ALLOTMENT UNDER ALTERNATIVE 5

Allotment and Acres	Grazing Systems	Class of Live-stock	Season of Use	Proposed Livestock Use in AUMs 1/: Federal Land Use At Start of Program 2/	Federal Land Trail-ing Use	Authorized State & Private Land Use	Total Live-stock Use	Wildlife 4/: Compet. Reserv. In AUMs 1/	Total Allow In AUMs 1/	Wild Horses 4/: Compet. Reserv. In AUMs 1/	Total Allow In AUMs 1/	Proposed 5/ Total Forage Use in AUMs 1/
12.*White Acorn	Alternately	Cattle	06/01-10/15	1,043		782	1,825					
46,794	Grazed	Sheep	05/16-10/31	758		500	1,258					
	2-Pasture &	Sheep	Spring		349		349					
	Rest-Rotation	Cattle	Fall		7		7					
	3-Pasture	TOTAL		1,801	356	1,282	3,439	217	1,279	None	None	4,718
13. Prospect	Combination	Cattle	05/16-10/31	1,855		599	2,454					
Mountain	Alternately	Sheep	05/16-09/10	1,601		322	1,923					
66,751	Grazed	Sheep	Spring		127		127					
	2-Pasture &		Fall		80		80					
	Rest-Rotation	Cattle	Spring		6		6					
	3-Pasture		Fall		5		5					
		TOTAL		3,456	218	921	4,595	504	3,750	None	None	8,345
14. Reservoir	Rest-Rotation	Cattle	10/16-10/31	61		20	81					
35,545	3-Pasture	Sheep	05/05-10/31	1,669		469	2,138					
		Horses	05/16-10/31	78		26	104					
		TOTAL		1,808	None	515	2,323	74	563	None	None	2,886
15.*Poston	Rest-Rotation	Cattle	05/16-06/30	164		43	207					
50,635	3-Pasture	Cattle	09/01-10/11	132		38	170					
		*Sheep	05/05-07/10	750		150	900					
		Sheep	09/10-12/15	1,457		290	1,747					
		Horses	05/16-10/31	52		16	68					
		Dual			84		84					
		TOTAL		2,555	84	537	3,176	124	1,047	None	None	4,223
16.*Pine Creek	Rest-Rotation	Cattle	07/01-10/31	523		103	626					
14,089	3-Pasture	Sheep	09/01-09/07	134		26	160					
		Horses	04/16-12/31	49		10	59					
		TOTAL		706	None	139	845	15	140	None	None	985
TOTALS 1,967,732				62,010	1,972	10,631	74,613	6,065	33,799	3,340	9,600	118,012

*Indicates an operator's desire to convert from a previously adjudicated class of livestock to that class shown. A total of 1,810,767 acres is in these allotments.

1/ An AUM is the amount of forage 1 cow, 5 sheep, 14.6 pronghorn, 5 deer, 1.5 elk, 1 moose, or 1 horse would eat in 1 month.

2/ Proposed livestock use levels by pasture are available for review in the Rock Springs District Office.

3/ This includes the state and private land AUMs that would be available as exchange of use (see glossary) under the proposed action.

4/ Competitive reservations are the portions of the livestock diets that overlap with those of wildlife and wild horse diets and which are needed to assure proper amounts of forage would be available for the numbers of wild animals expected in each allotment. Total allowance is the sum of these reservations and the additional forage available that wildlife and/or wild horses would use, but livestock would not use. Wild horse allowances represent enough forage for 800 animals for one year (800 X 12 = 9,600 AUMs) or the number of horses that are recommended for the area in the BLM's draft wild horse unit management plans. Wildlife allowances are based on the number of months each species would be expected in each allotment; numbers of animals are estimated from population data provided by the Wyoming Game and Fish Department at the time the AMPs were developed. See TABLE 1-8 for a breakdown of reservations by wildlife species.

5/ Total forage use is the sum of the total proposed livestock use and the total allowances for wildlife and wild horses.

TABLE 8-71

PREDICTED LONG-TERM SHEET EROSION UNDER ALTERNATIVE 5

Allotment	Acres	Geologic Erosion in Tons/Yr.	Other Sheet Erosion in Tons/Yr.	Total Erosion in Tons/Yr.	Change From Existing Rate in Tons/Yr.1/
Bar X	6,895	6,330	2,416	8,746	-5,980
Fish Creek	7,237	6,643	5,515	12,158	-4,611
Gold Creek	30,525	28,023	24,648	52,671	-8,628
Little Sandy-Little Prospect	185,660	168,437	308,859	477,296	-166,293
Steamboat Mountain2/	40,537	37,213	586,690	623,903	-61,421
Little Colorado:					
Green River Use Area2/	303,791	278,881	283,816	562,697	-167,415
Farson Use Area	205,123	188,302	387,939	576,241	-145,220
Big Sandy Use Area	218,042	200,163	367,449	567,612	-151,043
Red Desert2/	245,375	225,254	345,937	571,191	-62,894
Bush Rim2/	104,547	95,974	578,753	674,727	-124,915
Continental Peak2/	88,478	81,223	466,164	547,387	-93,875
Pacific Creek2/	202,856	186,223	979,487	1,165,710	-256,373
Sands2/	114,852	105,434	391,042	496,476	-44,708
White Acorn	46,794	42,956	99,811	142,767	-34,376
Prospect Mountain	66,751	61,276	117,885	179,161	-57,667
Reservoir	35,545	32,631	51,154	83,785	-20,946
Poston	50,635	46,483	109,911	156,394	-41,615
Pine Creek	14,089	12,934	14,097	27,031	-4,677
TOTALS	1,967,732	1,804,380	5,121,573	6,925,953	-1,452,657

1/ Difference between the total erosion tons per year in the table and under the existing environment as shown in TABLE 2-3.

2/ These allotments would be expected to achieve these rates in the short term and continue at that level in the long term.

TABLE 8-72

LONG-TERM EROSION BY CLASS BY ALLOTMENT UNDER ALTERNATIVE 5

Allotment	Light		Moderate		Excessive	
	Projected Acres	Acres Change From Existing 1/	Projected Acres	Acres Change From Existing 1/	Projected Acres	Acres Change From Existing 1/
Bar X	6,895	+2,124		-2,124		0
Fish Creek	7,237	+7,237		-7,237		0
Gold Creek	30,525	+15,272		-15,272		0
Little Sandy-Little Prospect	29,628	+29,628	156,032	-29,628		0
Steamboat Mountain 2/		0		0	40,537	0
Little Colorado: Green River Use Area 2/	201,689	+117,176	102,102	-117,176		0
Farson Use Are		0	205,123	0		0
Big Sandy Use Area	68,199	+68,199	149,843	-68,199		0
Red Desert 2/	80,717	+80,717	164,658	-80,717		0
Bush Rim 2/		0	32,533	0	72,014	0
Continental Peak 2/		0		0	88,478	0
Pacific Creek 2/		0	68,457	0	134,399	0
Sands 2/		0	76,866	+38,172	37,986	-38,172
White Acorn	7,622	+7,622	39,172	+426		-8,048
Prospect Mountain	23,361	+23,361	43,390	-23,361		0
Reservoir	10,932	0	24,613	0		0
Poston	14,864	0	35,771	0		0
Pine Creek	14,089	+14,089		-14,089		0
TOTAL	495,758	+365,425	1,098,560	-319,205	373,414	-46,220
(Percent Change From Existing)		(+280%)		(-23%)		(-11%)

NOTE: Light - less than 2 tons per acre per year.
Moderate - 2 to 5 tons per acre per year.
Excessive - greater than 5 tons per acre per year.
Average acres of erosion by pasture is available for review at the Rock Springs District Office.

1/ From TABLE 2-4.

2/ Indicated changes would be expected by the short term and would continue at that level in the long term.

Wind Erosion

The impacts would be the same as discussed under the proposed action.

Compaction

The relative degree of use by livestock in the short and long terms under Alternative 5 was estimated using a technique similar to that used in APPENDIX 2D for the current relative degree of use. TABLE 8-73 shows acres effectively used by livestock. Acres in the light, moderate, heavy, and severe intensity classes would decrease from 918,373 acres presently (TABLE 2-6) to 737,998 acres in the short term. This would be because of an increase in acres available as a result of additional watering facilities and a large decrease in the number of AUMs used in the Sandy area under this alternative. Acres in the heavy and severe grazing intensity classes would be reduced from 69,061 to 31,440 acres. This indicates that fewer acres would be subject to compaction, and that riparian areas, streams, ponds, etc., would be receiving far less use. The present high use areas (heavy and severe intensity classes) would tend to have a lower average concentration of use due to the rest provided by the grazing systems, increased acres available, and reduced number of AUMs used (TABLE 8-73).

The greatest decrease in AUMs used would be in the allotments indicated by Footnote 2 in TABLE 8-71. The reduced grazing intensity in these allotments would mean that cattle would not have to use the steep slopes of Mapping Units 132, 233, and 333 to seek forage. Compaction on these areas would not occur and vegetal matter would be left to protect these slopes from erosion. Due to the less intensive use, soils and vegetation on milder slopes would recover, providing a more stable, productive resource base.

Acres effectively used by livestock would increase from 918,373 acres, under existing conditions, to 947,689 in the long term under this alternative (TABLE 8-73). This would occur because of an increase in livestock use in the Sandy area in the long term. Acres in the heavy and severe grazing intensity classes would be reduced from 69,061 acres, presently, to 45,096, indicating fewer acres would be subject to compaction. Much of the gain in the effectively used acres would be in those allotments indicated by Footnote 2 in TABLE 8-71. These allotments would be the ones that received the least intensive use in the short-term period and would be capable of a more intensive use in the long term. However, these allotments would receive more intensive use only if studies indicated such an increase was justified. The 45,096 acres in the heavy and severe classes represents a 13,656-acre increase from the short term (TABLE 8-71). The rest provided by the grazing systems and the increased ground cover provided by the short-term action would alleviate compaction in this area.

Acres effectively used by livestock would increase by 209,691 acres in the long term (TABLE 8-71). This increase in effectively used acres does not mean that acres in highly erodible mapping units (132, 233, 333) would be involved. Assuming uniform livestock distribution for the watering facilities in or adjacent to the nearly level to moderately sloping areas, livestock could meet their forage demands without venturing onto steeply sloped, highly erodible areas.

Water Resources

Water Use

Water consumption by livestock under this alternative would be 70 acre-feet per year during the short term and 93 acre-feet per year at the end of the long term (TABLE 8-74). This would be a decrease of 9 acre-feet per year in the short term from present use. The decrease in consumptive use is due to the proposed reduction in livestock in the short term. A 14 acre-feet per year increase over the existing rate would occur in the long term with the anticipated increase in livestock use (TABLE 8-74).

The evaporation losses from the additional 96 proposed reservoirs and pits would be 418 acre-feet per year in the long term (TABLE 8-75). Total evaporation losses in the Sandy area would be 1,294 acre-feet per year.

Streamflow

Changes in runoff from Alternative 5 would have no measureable effect on annual perennial streamflow (see Chapter 3 discussion). Storm runoff from a ten-year event would decrease 27% in the short term and 31% in the long term below the existing levels (TABLE 8-76). A decrease in storm runoff would occur in the long term in all allotments except the Sands Allotment, where storm runoff would not change from the existing level.

The decrease in storm runoff would be due to increased infiltration rates from the reduction in livestock and a projected long-term increase in vegetal cover in the Green River Use Area of the Little Colorado Allotment and the Steamboat Mountain, Red Desert, Bush Rim, Continental Peak, Pacific Creek, and Sands Allotments (see vegetation TABLE 8-79).

Storm runoff values were calculated on model basins within the Sandy area. Input to these models were allotment mean infiltration rates by vegetation types (APPENDIX 3A), allotment mean vegetation conditions, and allotment acres by intensity of use class (TABLE 8-73). Runoff values reflect storm runoff from the model basins if the mean allotment conditions existed within the model basin. It was not feasible to calculate runoff for each allotment. Relative changes based on model watersheds are listed in TABLE 8-76. Runoff would increase above existing levels around proposed water developments with the anticipated intensive grazing by livestock near water (Mueggler 1965) causing decreased infiltration rates.

TABLE 8-73

PROJECTED SHORT-TERM AND LONG-TERM ACRES OF GRAZING INTENSITY UNDER ALTERNATIVE 5

SHORT-TERM MEAN

Allotment	Marginal Slight*	Light*	Moderate*	Heavy*	Severe*	Total Acres
Bar X	0	5,427	1,039	295	134	6,895
Fish Creek	0	5,773	1,045	291	128	7,237
Gold Creek	2,877	22,506	3,752	983	407	30,525
Little Sandy–Little Prospect	60,074	106,708	13,769	3,627	1,482	185,660
Steamboat Mountain	37,703	2,470	276	65	23	40,537
Little Colorado:						
Green River Use Area	207,665	81,093	10,982	2,880	1,171	303,791
Farson Use Area	122,179	68,667	10,327	2,781	1,169	205,123
Big Sandy Use Area	132,021	72,260	9,961	2,677	1,123	218,042
Red Desert	203,478	35,200	4,887	1,286	524	245,375
Bush Rim	96,352	7,042	856	215	82	104,547
Continental Peak	50,241	32,740	4,057	1,035	405	88,478
Pacific Creek	149,190	46,206	5,552	1,383	525	202,856
Sands	99,553	13,278	1,522	366	133	114,852
White Acorn	12,711	28,409	4,131	1,093	450	46,794
Prospect Mountain	20,937	38,619	5,288	1,363	544	66,751
Reservoir	11,671	20,046	2,747	755	326	35,545
Poston	17,823	27,762	3,664	978	408	50,635
Pine Creek	5,259	7,559	938	239	94	14,089
TOTAL**	1,229,734	621,765	84,793	22,312	9,128	1,967,732

* **Marginal** - Those acres generally too distant from water to be grazed.
Slight - Those acres within reach of water but grazed at an intensity greater than 75 acres per AUM.
Light - Grazing intnesity from 16 to 75 acres per AUM.
Moderate - Grazing intensity from 5.5 to 16 acres per AUM.
Heavy - Grazing intensity from 2 to 5.5 acres per AUM.
Severe - Grazing intensity less than 2 acres per AUM.

** Totals by class will not total to exact acreages in allotments due to rounding inherent in methods of calculation.

TABLE 8-73 (Continued)

PROJECTED SHORT-TERM AND LONG-TERM ACRES OF GRAZING INTENSITY UNDER ALTERNATIVE 5

LONG-TERM MEAN

Allotment	Marginal Slight*	Light*	Moderate*	Heavy*	Severe*	Total Acres
Bar X	0	5,353	1,091	310	141	6,895
Fish Creek	0	5,696	1,099	306	136	7,237
Gold Creek	1,579	23,377	4,066	1,063	440	30,525
Little Sandy-Little Prospect	54,935	111,010	14,372	3,790	1,553	185,660
Steamboat Mountain	31,141	8,190	914	216	76	40,537
Little Colorado:						
Green River Use Area	181,460	98,666	17,207	4,570	1,888	303,791
Farson Use Area	102,320	83,118	14,240	3,833	1,612	205,123
Big Sandy Use Area	116,342	84,160	12,616	3,445	1,479	218,042
Red Desert	169,149	56,654	13,971	3,887	1,714	245,375
Bush Rim	70,849	28,959	3,516	884	339	104,547
Continental Peak	33,256	46,882	6,156	1,570	614	88,478
Pacific Creek	116,172	74,421	9,085	2,293	885	202,856
Sands	88,344	23,008	2,635	634	231	114,852
White Acorn	7,360	31,758	5,567	1,488	621	46,794
Prospect Mountain	20,483	38,987	5,350	1,381	550	66,751
Reservoir	11,453	20,230	2,772	761	329	35,545
Poston	11,644	32,990	4,354	1,162	485	50,635
Pine Creek	3,556	8,989	1,134	293	117	14,089
TOTAL	1,020,043	782,448	120,145	31,886	13,210	1,967,732

TABLE 8-74

WATER USE BY LIVESTOCK, INCLUDING EXCHANGE OF USE, UNDER ALTERNATIVE 5

Allotment	Short Term in Acre-Feet*	Long Term in Acre-Feet*
Bar X	0.74	0.78
Fish Creek	0.75	0.78
Gold Creek	2.86	3.05
Little Sandy-Little Prospect	10.84	11.22
Steamboat Mountain	0.40	0.99
Little Colorado:		
Green River Area	8.51	12.29
Farson Area	7.78	10.17
Big Sandy Area	7.82	9.57
Red Desert	3.99	9.69
Bush Rim	1.05	3.20
Continental Peak	3.37	4.70
Pacific Creek	5.56	8.15
Sands	1.75	2.74
White Acorn	3.16	4.06
Prospect Mountain	4.23	4.27
Reservoir	2.14	2.15
Poston	2.92	3.37
Pine Creek	0.78	0.91
ALLOTMENT TOTAL	68.65	92.09
CUSTODIAL PASTURES**	1.22	1.22
GRAND TOTAL	69.87	93.31

* Based on use of 300 gallons per AUM. AUMs from TABLE 8-70.

** From national resource land AUMs.

TABLE 8-75

INCREASED EVAPORATION LOSSES IN ACRE-FEET BY THE PROPOSED RESERVOIRS OVER THE LONG TERM UNDER ALTERNATIVE 5

	Number of Proposed		Evaporation Losses in Acre Feet		
Allotment	Pits	Earthfill	Pits	Reservoirs	Total
Bar X	2	0	2.98	0	2.98
Fish Creek	1	0	1.49	0	1.49
Little Sandy-Little Prospect	10	24	14.90	140.64	155.54
Steamboat Mountain	3	2	4.47	11.72	16.19
Continental Peak	0	3	0	17.58	17.58
Sands	11	1	16.39	5.86	22.25
White Acorn	0	9	0	52.74	52.74
Prospect Mountain	1	12	1.49	70.32	71.81
Reservoir	2	3	2.98	17.58	20.56
Poston	3	8	4.47	46.88	51.35
Pine Creek	0	1	0	5.86	5.86
TOTALS	33	63	49.17	369.18	418.35

Reservoir evaporation rate = 5.86 acre-feet/year. Pit evaporation rate = 1.49 acre-feet/year (APPENDIX 2G).

No water developments are proposed for the custodial pastures and Palmer Draw area, therefore there would be no evaporation losses for these areas.

TABLE 8-76

MODEL STORM RUNOFF IN ACRE-FEET BY ALLOTMENT UNDER ALTERNATIVE 5

(10-YEAR STORM)

Allotment	Existing	Short-Term	Long-Term
Bar X	1.5	1.5	0.5
Fish Creek	0.9	0.9	0.4
Gold Creek	16.5	16.3	12.9
Little Sandy-Little Prospect	45.1	28.0	23.2
Steamboat Mountain	120.8	97.8	92.2
Little Colorado	14.7	11.2	11.2
Green River Area		8.9	8.9
Farson Area		14.9	14.7
Big Sandy Area		10.5	10.5
Red Desert	17.1	13.3	12.3
Bush Rim	66.9	66.7	66.7
Continental Peak	82.9	62.4	61.8
Pacific Creek	58.2	33.8	33.8
Sands	2.0	0.7	2.0
White Acorn	12.8	11.9	7.5
Prospect Mountain	11.4	6.4	4.3
Reservoir	22.9	13.8	7.6
Poston	15.5	12.4	8.8
Pine Creek	2.2	2.2	1.8
WEIGHTED MEANS	29.5	21.5	20.5
PERCENT CHANGE FROM EXISTING SITUATION		-27%	-31%

Water Quality

This alternative would have no measurable effect on water quality in perennial streams within the Sandy area or downstream. As perennial streamflow would not be expected to change, sediment transport would remain unchanged (see Chapter 3 Discussion).

Sediment yield in the intermittent streams in the Sandy area would decrease with the decrease in storm runoff (TABLE 8-76). The PSIAC method (APPENDIX 2F) was applied to this alternative, and these calculations indicate there would be a 13% decrease in sediment yield from the intermittent streams. Total sediment yield would be 1,704,022 tons per year. This would improve water quality.

It is estimated that all earthfill type reservoirs would result in increased sediment yields from headcutting and channel degradation unless the reservoirs are maintained during the project life. Salinity levels would decrease below existing levels in intermittent streams with the decrease in runoff (TABLE 8-76).

Channel stability in the Sandy area (TABLE 8-77) would improve by 5% due to a reduction of grazing intensity near water (TABLE 8-78). Channel stability is a measure of the erodibility of bed and bank sediment. Channel stability was evaluated by determining the relative grazing intensity of livestock, the length of rest of each pasture, and the channel stability improvement potential (APPENDIX 3B). It would improve in all allotments except Pacific Creek, Reservoir, and Poston where channel stability would not change from existing levels.

Fecal coliform bacteria, which are indicators of bacteriological contamination, would decrease below existing levels in the Sandy area because of the reduction in livestock and subsequent decrease in grazing intensity near water (TABLE 8-78). Kunkle (1970) found "that only the area immediately adjacent to the stream, rather than the entire watershed, is of major importance in terms of introducing this sort of pollution into the stream"

Vegetation

This alternative involves the same grazing systems as the proposed action; however, the level of use in both the short and long terms would be lower. A complete discussion of the systems and impacts can be found in Chapters 1 and 3. Ground and vegetal cover would be expected to increase to the same levels in the long term as under the proposed action (TABLE 8-79). Forage production would also be expected to increase to similar levels (TABLE 8-80). While the impacts of this alternative are similar to the proposed action, it is estimated that the cover and production levels would be reached sooner. Range condition and trend would also be similar to the proposed action, although reaching predicted levels at an earlier data. TABLE 8-81 shows predicted long-term forage production for each major animal species.

Threatened or Endangered Plants

Impacts would be similar to the proposed action for the two species suspected to occur in the Sandy area.

Wildlife

Terrestrial

Impacts from this alternative would affect the populations of the four major wildlife species in the Sandy area (pronghorn antelope, mule deer, elk, and moose) as well as sage grouse, waterfowl, and numerous nongame species. The primary factors relative to the impacts on wildlife populations to be considered are food, water, cover, space, and migration habits, and the conditions and availability of each factor.

Impacts to wildlife would be identical to those identified under the proposed action, except that the benefits from increased forage production and cover would probably come sooner. This includes the impacts to the threatened and endangered peregrine falcon and black-footed ferret.

Aquatic

Reducing livestock numbers or adjusting seasons of use does not necessarily alleviate the impacts of livestock grazing on aquatic habitat. Riparian vegetation could still be heavily utilized under various stocking rates and grazing systems. Reduction of livestock numbers could mean that fewer animals would spend a longer period of time grazing the riparian habitat. The grazing treatments and levels of use in Alternative 5 are therefore predicted to have the same impacts as the proposed action.

Wild Horses

Wild horse numbers would be reduced to the management levels recommended in the proposed action. Allocation of forage for horses would be as shown in TABLE 1-4. Horses would be located in areas under three-pasture rest-rotation systems. Wild horses (150) would be located in the Little Colorado Allotment, which is to receive an average reduction in livestock use of 40% for the three use areas. There would be 650 wild horses in the Red Desert, Bush Rim, and Continental Peak Allotments, which are to be reduced 74, 80 and 44%, respectively, from the present livestock use.

Under this alternative, there could be an increase in the wild horse numbers on the above allotments due to decreased competition with livestock for forage and water. However, the above figures are the proposed management levels, and wild horses would be reduced to maintain these numbers. Other impacts from fence construction and water developments would be the same as the proposed action.

TABLE 8-77

PROJECTED CHANNEL STABILITY RATING
BY ALLOTMENT UNDER ALTERNATIVE 5*

Allotment	Stream Miles	Present	Potential	23 Years (Future)
Bar X	9.00	99	79	90
Fish Creek	5.50	92	84	84
Gold Creek	39.00	96	90	90
Little Sandy-Little Prospect	42.25	103	92	95
Steamboat Mountain	9.50	110	89	92
Little Colorado:				
Green River	30.00	86	78	80
Big Sandy	30.25	102	95	96
Continental Peak	6.25	99	79	97
Pacific Creek	48.00	107	92	107
White Acorn	22.75	96	81	92
Prospect Mountain	24.75	103	98	98
Reservoir	14.75	111	111	111
Poston	3.00	104	104	104
Pine Creek	10.50	97	92	95
MEAN		100	90	95
TOTAL MILES	295.25			
PERCENT CHANGE			-10%	-5%

* Channel Stability Rating	Condition
38	Excellent
39-76	Good
77-95	High Fair
96-114	Low Fair
115+	Poor

TABLE 8-78

RELATIVE GRAZING INTENSITY 100 YARDS FROM WATER UNDER ALTERNATIVE 5

Allotment	Existing	Short Term
Bar X	92	77
Fish Creek	65	72
Gold Creek	44	40
Little Sandy-Little Prospect	59	44
Steamboat Mountain	7	0
Little Colorado:		
Green River Use Area	60	45
Farson Use Area	60	54
Big Sandy Use Area	60	46
Red Desert	3	31
Bush Rim	1	1
Continental Peak	35	29
Pacific Creek	10	7
Sands	15	1
White Acorn	45	44
Prospect Mountain	42	33
Reservoir	67	55
Poston	49	44
Pine Creek	35	29
MEAN	38	32
% CHANGE		-16%

TABLE 8-79

PROJECTED AVERAGE PERCENT GROUND COVER AND VEGETAL COVER UNDER ALTERNATIVE 5**

No.	Allotment	Sagebrush-Grass Percent Ground Cover	Sagebrush-Grass Percent Vegetal Cover	Saltbush-Winterfat Percent Ground Cover	Saltbush-Winterfat Percent Vegetal Cover	Greasewood Percent Ground Cover	Greasewood Percent Vegetal Cover	Meadows Percent Ground Cover	Meadows Percent Vegetal Cover
1.	Bar X	60	17					94	32
2.	Fish Creek	46	15					91	26
3.	Gold Creek	40	17					73	25
4.	Little Sandy-Little Prospect	46	15					90	32
5.	Steamboat Mountain*	61	11			56	12	60	22
6.	Little Colorado								
6a.	Green River Use Area*	30	17	25	15	29	11		
6b.	Farson Use Area	30	17	25	15	29	11		
6c.	Big Sandy Use Area	30	17	25	15	29	11	41	35
7.	Red Desert*	32	14	30	9	23	6		
8.	Bush Rim*	34	13	46	11	15	16	97	22
9.	Continental Peak*	56	16	18	7	78	11	97	27
10.	Pacific Creek*	48	14	75	6	23	21	94	24
11.	Sands*	35	15			15	12	78	26
12.	White Acorn	63	16					90	33
13.	Prospect Mountain	42	15					66	32
14.	Reservoir	38	12					59	30
15.	Poston	34	13					61	32
16.	Pine Creek	62	15					69	28
	TOTAL AVERAGES	44	15	35	11	33	12	77	28

No.	Allotment	Grass		Perennial Forb		Mountain Shrub		Conifer	
1.	Bar X								
2.	Fish Creek								
3.	Gold Creek					95	20	78	9
4.	Little Sandy-Little Prospect					85	12		
5.	Steamboat Mountain			16	6	83	18		
6.	Little Colorado								
6a.	Green River Use Area	30	23					30	12
6b.	Farson Use Area	30	23						
6c.	Big Sandy Use Area								
7.	Red Desert	20	15	17	9				
8.	Bush Rim	20	15	17	12	64	19	86	9
9.	Continental Peak	20	14	23	14	94	19		
10.	Pacific Creek	52	12	12	12	94	18	84	11
11.	Sands	37	18	12	12			81	8
12.	White Acorn					58	20	78	11
13.	Prospect Mountain					85	18	93	3
14.	Reservoir								
15.	Poston								
16.	Pine Creek								
	TOTAL AVERAGES	30	17	16	11	82	18	76	9

* Projected averages will be reached in the short term.

**See Glossary

TABLE 8-80

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 5 BY ANIMAL CLASS IN POUNDS DRY WEIGHT OF FORAGE AND AUMS

	Cattle and Horses		Sheep		Wild Horses		Pronghorn	
Allotment	Production	Use	Production	Use	Production	Use	Production	Use
1. Bar X	847,080 (1,086)	600,600 (770)	933,750 (1,245)	52,500 (70)	0 (0)	0 (0)	561,782 (697)	29,822 (37)
2. Fish Creek	1,015,560 (1,302)	663,780 (851)	1,027,500 (1,370)	0 (0)	0 (0)	0 (0)	807,612 (1,002)	36,270 (45)
3. Gold Creek	4,047,420 (5,189)	2,421,120 (3,104)	3,115,500 (4,154)	0 (0)	0 (0)	0 (0)	3,447,262 (4,277)	153,946 (191)
4. Little Sandy- Little Prospect	14,231,100 (18,245)	6,664,320 (8,544)	15,503,250 (20,671)	2,737,500 (3,650)	0 (0)	0 (0)	20,956,806 (26,001)	792,298 (983)
5. Steamboat Mountain	1,811,160 (2,322)	758,940 (973)	2,405,250 (3,207)	75,000 (100)	0 (0)	0 (0)	1,912,638 (2,373)	124,124 (154)
6. Little Colorado: 6a. Green River	21,060,780 (27,001)	7,711,080 (9,886)	22,365,750 (29,821)	2,601,750 (3,469)	22,388,400 (24,876)	907,200 (1,008)	21,514,558 (26,693)	932,542 (1,157)
6b. Farson Use Area	14,420,640 (18,488)	55,380 (71)	15,481,500 (20,642)	8,233,500 (10,978)	13,819,400 (16,466)	712,800 (792)	14,456,416 (17,936)	670,592 (832)
6c. Big Sandy Use Area	13,057,200 (16,740)	2,162,940 (2,773)	14,102,250 (18,803)	5,717,250 (7,623)	0 (0)	0 (0)	14,430,624 (17,904)	811,642 (1,007)
7. Red Desert	16,329,300 (20,935)	5,599,620 (7,179)	17,439,000 (23,252)	2,514,000 (3,352)	17,681,400 (19,646)	4,749,300 (5,277)	14,628,094 (18,149)	519,870 (645)
8. Bush Rim	5,534,100 (7,095)	1,443,780 (1,851)	7,293,750 (9,725)	1,222,500 (1,630)	6,385,500 (7,095)	1,206,000 (1,340)	6,655,142 (8,257)	336,102 (417)
9. Continental Peak	5,658,120 (7,254)	1,017,120 (1,304)	6,844,500 (9,126)	2,851,500 (3,802)	6,528,600 (7,254)	1,064,700 (1,183)	6,589,050 (8,175)	270,010 (335)
10. Pacific Creek	13,363,740 (17,133)	3,112,980 (3,991)	15,165,000 (20,220)	3,645,750 (4,861)	0 (0)	0 (0)	17,232,280 (21,380)	761,670 (945)
11. Sands	4,896,840 (6,278)	1,868,100 (2,395)	5,598,000 (7,464)	437,250 (583)	0 (0)	0 (0)	7,804,498 (9,683)	310,310 (385)
12. White Acorn	5,531,760 (7,092)	1,907,880 (2,446)	4,949,250 (6,599)	1,473,750 (1,695)	0 (0)	0 (0)	3,245,762 (4,027)	188,604 (234)
13. Prospect Mountain	5,889,780 (7,551)	1,948,440 (2,498)	6,139,500 (8,186)	1,605,750 (2,141)	0 (0)	0 (0)	8,454,134 (10,489)	268,398 (333)
14. Reservoir	2,116,140 (2,713)	157,560 (202)	2,137,500 (2,850)	1,603,500 (2,138)	(0)	(0)	3,929,250 (4,875)	146,692 (182)
15. Poston	3,502,200 (4,490)	460,980 (591)	4,392,750 (5,857)	2,303,250 (3,071)	(0)	(0)	6,493,942 (8,057)	146,692 (182)
16. Pine Creek	1,496,820 (1,919)	623,220 (799)	2,142,750 (2,857)	138,750 (185)	(0)	(0)	925,288 (1,148)	42,718 (53)
TOTALS	134,809,740 (172,833)	39,177,840 (50,228)	147,036,750 (196,049)	37,213,500 (49,618)	67,803,300 (75,337)	8,640,000 (9,600)	154,045,138 (191,123)	6,542,302 (8,117)

TABLE 8-80 (Continued)

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 5 BY ANIMAL CLASS IN POUNDS DRY WEIGHT OF FORAGE AND AUMS

Allotment	Deer		Elk		Moose	
	Production	Use	Production	Use	Production	Use
1. Bar X	626,430 (1,330)	75,360 (160)	0 (0)	0 (0)	106,380 (197)	0 (0)
2. Fish Creek	1,047,504 (2,224)	75,360 (160)	0 (0)	0 (0)	359,100 (665)	19,440 (36)
3. Gold Creek	3,999,261 (8,491)	495,021 (1,051)	6,710,580 (12,427)	447,120 (828)	1,162,080 (2,152)	51,840 (96)
4. Little Sandy-Little Prospect	21,318,402 (45,262)	3,199,974 (6,794)	4,884,300 (9,045)	2,021,760 (3,744)	1,817,640 (3,366)	226,800 (420)
5. Steamboat Mountain	1,964,070 (4,170)	50,868 (108)	1,979,640 (3,666)	77,760 (144)	0 (0)	0 (0)
6. Little Colorado: 6a. Green River	3,894,699 (8,269)	0 (0)	0 (0)	0 (0)	51,840 (96)	0 (0)
6b. Farson Use Area	2,632,419 (5,589)	0 (0)	0 (0)	0 (0)	1,080 (2)	0 (0)
6c. Big Sandy Use Area	3,365,766 (7,146)	168,618 (358)	1,298,700 (2,405)	0 (0)	0 (0)	0 (0)
7. Red Desert	90,432 (192)	424,842 (902)	1,723,680 (3,192)	99,360 (184)	0 (0)	0 (0)
8. Bush Rim	4,035,528 (8,568)	176,154 (374)	5,637,600 (10,440)	172,800 (320)	0 (0)	0 (0)
9. Continental Peak	5,842,284 (12,404)	538,353 (1,143)	304,020 (563)	108,000 (200)	25,380 (47)	9,180 (17)
10. Pacific Creek	18,000,678 (38,218)	313,215 (665)	10,014,840 (18,546)	457,920 (848)	178,200 (330)	53,460 (99)
11. Sands	8,835,960 (18,760)	188,871 (401)	7,853,220 (14,543)	50,760 (94)	50,760 (94)	(0)
12. White Acorn	3,435,945 (7,295)	756,426 (1,606)	1,885,140 (3,491)	535,680 (992)	1,084,320 (2,008)	51,840 (96)
13. Prospect Mountain	9,090,771 (19,301)	755,955 (1,605)	1,868,940 (3,461)	656,640 (1,216)	450,900 (835)	58,320 (108)
14. Reservoir	3,968,646 (8,426)	349,482 (742)	(0)	(0)	61,560 (114)	25,920 (48)
15. Poston	5,599,248 (11,888)	29,202 (62)	(0)	(0)	59,400 (110)	19,440 (36)
16. Pine Creek	1,076,706 (2,286)	113,511 (241)	262,440 (486)	41,040 (76)	320,220 (593)	12,960 (24)
TOTALS	98,824,749 (209,814)	7,711,212 (16,372)	44,423,100 (82,265)	4,668,840 (8,646)	5,728,860 (10,609)	529,200 (980)

TABLE 8-81

PREDICTED LONG-TERM FORAGE PRODUCTION FOR MAJOR ANIMAL SPECIES IN THE SANDY AREA WITH IMPLEMENTATION OF ALTERNATIVE 5

Species	AUMs*	Animal Months Provided*	Pounds Available Dry Weight Forage
Cattle	172,833	172,833	134,809,740
Sheep	196,049	980,245	147,036,750
Wild Horses	75,337	75,337	67,803,300
Pronghorn Antelope	191,123	2,790,396	154,045,138
Mule Deer	209,814	1,049,070	98,824,749
Elk	82,265	123,398	44,423,100
Moose	10,609	10,609	5,728,860

*These figures represent the total proper use grazing capacity for each grazing animal. Example: If the Sandy area were grazed by cattle only, proper use would be 118,790 AUMs; if grazed by sheep only, proper use would be 138,671 AUMs; etc. These figures were developed from the 1964-65 ocular Reconnaissance Range Survey, which is available for review in the Rock Springs District Office. The methodology and an example are shown in Appendix 2I.

Cultural Resources

The number and percentages of livestock that would be reduced in the short term from the present under this alternative are indicated in TABLE 8-82. Reductions in livestock numbers in the Steamboat Mountain, Little Colorado, Red Desert, Bush Rim, Continental Peak, Pacific Creek, Sands, White Acorn, and Pine Creek Allotments would be significant enough in most cases to reduce the effects of livestock trampling upon archeological sites in those allotments. TABLE 8-83 indicates the number of acres and percentages of each allotment which would be moderately, heavily, and severely grazed. These figures indicate that livestock use would be severe in the Bar X, Fish Creek, Gold Creek, White Acorn, and Poston Allotments. This use would lead to severe trampling in these allotments.

Trampling would cause the breakage of artifacts and their vertical and horizontal displacement through the churning of the site's surface. In one study in eastern Colorado, a collection of artifacts from around a stock tank revealed that all had edge modification from cattle trampling (Knudson 1974). The modifications were severe enough that the artifacts could be classified as tools rather than debritage. This would seriously affect the study of artifacts from the surface of areas which medium to large animals have been utilizing. The personal observations of a number of archeologists are that cattle break and rearrange artifacts around water sources or in areas of heavy trailing.

In another experiment in northern Nevada, 48% of a group of artifacts received some form of damage from trampling, ranging from nicking to major breakage. Over 38% had been horizontally displaced, and almost all were vertically displaced (Roney 1977).

The primary impact of the grazing system away from water sources would come in May and June when the ground is soft. Trampling would lead to erosion along cattle trails and to sheet erosion, which would damage sites by the vertical and horizontal displacement of artifacts. Sheet erosion is currently a major factor in soil mapping units 114, 132, 233, 333, 115, and 223, which constitute 26% of the Sandy area. Most of the sheet erosion is due to geologic causes; however, some of it is due to livestock trampling, especially in areas of heavy livestock use. TABLE 8-84 shows the percentage of erosion from causes other than geologic in those allotments where the erosion rate would be affected by this alternative.

While sheet erosion from other than natural causes would be severe in these allotments, this is the only alternative with any reduction in sheet erosion in the short term. Over the short term this would result in a 10 to 15% loss of archeological resources as sites would be gradually eroded, leading to a displacement of artifacts and the loss of other data vital to the interpretation of archeological sites. Long term impacts would depend on the amount of AUMs restored in 23 years.

The presence of livestock and their concentration under intensive management in various pastures at various times of the year would create a visual intrusion and detract from the prehistoric environment by the introduction of domestic animals. This would slightly decrease the public's experience and appreciation of the archeological and pre-1880 historical values.

The construction of range improvements would be the same as the proposed action, except for the 9 miles of fence in the Steamboat Allotment, which would not be built. The impacts upon historical sites and trails would be the same as the proposed action except for a slight reduction in trampling due to fewer livestock being present.

Visual Resources

The visual effects of this alternative would be site-specific and would be related to fencing and concentrated trampling in stream bottoms. These effects currently exist throughout the landscape. Change in the visual resource for the area would be negligible. Analysis of visual effects was accomplished using the contrast rating system. The contrast ratings are discussed in Chapter 2 (TABLE 2-65).

Recreation Resources

Recreation experiences would change in quality in the Sandy area. The factors identified in Alternative 5 which would influence visitor use are: (1) trampling and accumulation of feces; (2) the growth and development of willows on stream bottoms; and (3) impeded access by the checkerboard fence.

Some individuals would tolerate the same site under poorer conditions than others. Those who would not tolerate certain site conditions would go elsewhere. The measurement of visitor days is based on that movement. Movement may be to or from Forest Service land, or it may be a shifting of use within the Sandy area between allotments.

The visitor use figures are hypothetical. Reductions of visitor use shown are more realistic than increased visitor use because improved site character does not necessarily generate a demand to take advantage of it, and a certain amount of the positive or negative movement of people would be within the Sandy area.

The impacts shown on TABLE 8-85 are based upon the same areas as defined in the proposed action. Shifts of boundary lines would have an insignificant effect upon the visitor use figures by allotment and no effect upon the aggregate impact of this alternative on recreation.

TABLE 8-86 shows visitor use under this alternative for the various recreation activities. Visitor use would also vary with the base resource in the case of hunting. It is assumed that the visitor use would vary indirectly with animal populations, depending upon a wildlife management policy.

A potential hazard that is related to livestock grazing from soil and waterborne diseases, including parasites, may occur to recreation seekers. The hazard has not been quantified because of lack of data.

TABLE 8-82

PROJECTED DECREASE IN LIVESTOCK FROM THE PRESENT IN THE SHORT TERM UNDER ALTERNATIVE 5

Allotment	Number Reduced	%
Bar X	72	8
Fish Creek	74	8
Gold Creek	417	13
Little Sandy-Little Prospect	835	7
Steamboat Mountain	1,274	75
Little Colorado	17,188	40
Red Desert	12,387	74
Bush Rim	4,677	80
Continental Peak	2,891	44
Pacific Creek	5,623	48
Sands	2,144	53
White Acorn	1,945	36
Prospect Mountain	89	2
Reservoir	279	2
Poston	973	2
Pine Creek	279	25
TOTAL	51,147	41

TABLE 8-83

PROJECTED ACRES AND PERCENT OF ALLOTMENT
INTENSIVELY USED BY LIVESTOCK UNDER ALTERNATIVE 5

Allotment	Acres	%
Bar X	1,542	22
Fish Creek	1,541	21
Gold Creek	5,569	18
Little Sandy- Little Prospect	19,715	11
Steamboat Mountain	1,206	3
Little Colorado	60,890	8
Red Desert	19,572	1
Bush Rim	4,739	5
Continental Peak	8,340	9
Pacific Creek	12,263	6
Sands	3,500	3
White Acorn	7,676	16
Prospect Mountain	7,281	11
Reservoir	3,862	11
Poston	6,001	12
Pine Creek	1,544	11
TOTAL	165,241	8

TABLE 8-84

PERCENT OF SHEET EROSION OTHER THAN GEOLOGIC
EROSION BY ALLOTMENT IN THE SHORT TERM UNDER ALTERNATIVE 5

Allotment	Short Term
Steamboat Mountain	94%
Little Colorado Green River Use Area	50%
Red Desert	61%
Bush Rim	86%
Continental Peak	85%
Pacific Creek	84%
Sands	79%

TABLE 8-85

PERCENT CHANGE IN VISITOR USE FROM EXISTING CONDITIONS UNDER ALTERNATIVE 5

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy/ Prospect	Steam-Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Change in cent Use
Sand Dune Rally											0						0
Recreation Vehicle			0	-70	-20		0	0	0	-50	-50	-40	-40			0	-33
Camping: Trailer	0	+25	+25	+25	+100	+100		0	0	+25		0	+25	+100	+100	0	+25
Drycamp: Tent	-18	0	+6	-5		+80						+11	+5	0	0	0	+8
Tent Camping	-5	+18	+25	+19		+400			0			-5	+25	+321	+321	0	+44
Picnic: Drycamp	+38	0	+11	0							+10	+11				0	-26
Picnic	-7	+44	+43	+43					0			0		+150		0	+44
Camping: Camping Areas			+33			+900						0	+33	+900		0	+884
Picnic: Picnic Areas			+33			+900						0	+33	+900		0	+224
Hunting																	
Moose	0	0	0						0			0	+100	0	+100		58
Elk	0	0	-10	-10	+10			0		0	0	-10	-10		0	0	-8
Deer	0	0	0	-10	+12	+11	0	0	0	0	0	-10	-10	+17	0	0	-1
Antelope	0	0	0	-9	0	0	0	0	0	0	0	0	0	0	-17	0	0
Grouse			+13	0					-4			0	+17				0
Sage Grouse	0	+14	+32	+11	+56			0		+6		+25	+47			+25	+20
Dove			0		42						+3			+75	+100	0	+14
Goose/Duck						+39								+72			+43
Cottontail						+59					+11						+38
Rock Collecting	0			0	0	+100		0	0	0				0			+18
Fishing: Stream	0	+24	+6	+25					+12			0	+150	+147	+200	0	+43
Floatboat/Canoe	0	0	+5	-15		+19			0			-1	+17	+18	+271		+35
Fishing: Reservoir						+11								+11			+11
Boating						0								0			0
Waterskiing						+26								+25			+26
Swimming						0								0			0
Snowplaying	0	0	0									0				0	0
Cross-Country Skiing			-11	0								-25					-13
Snowmobile			-5			-28					-5	-10					-8
Sightseeing Highway	0		0	0		0				0	0	0		0	0	+11	0
Sightseeing: General	0	-40	-40	-40	0	+11	0	0	0	-20	-20	-25	-25	-11		-41	-20
CHANGE IN TOTAL USE	-1%	+6	+7	+4	+1	+286	0	0	0	+2	-7	-3	+28	+330	+141	+1	+96

TABLE 8-86

PROJECTED VISITOR DAYS PER YEAR BY ACTIVITY BY ALLOTMENT UNDER ALTERNATIVE 5

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy-Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Total
Sand Dune Rally											3,700						3,700
Recreation Vehicle			360	241	222		805	68	35	117	124	189	428			15	2,604
Camping: Trailer	622	74	15,404	8,485	58	3,824		440	630	755		8,626	6,584	1,746	964	46	48,258
Dry Camp: Tent	32	4	813	403		191						599	347	56	30	3	2,478
Tent Camping	110	13	2,889	1,511		1,595			7			1,536	1,235	691	379	9	9,975
Picnic: Dry Camp	11	2	50	60								31				2	156
Picnic	67	26	579	771					30		74	252		250		18	2,067
Camping: Camping Areas			1,600			58,340						100	933	78,750		100	139,823
Picnic: Picnic Areas			725			660						45	449	510		45	2,434
Hunting Moose	1	1	1						1			1	6	4	4		19
Elk	1	20	394	35	22			37		12	7	81	150	4	41	30	834
Deer	2	3	60	119	37	224	10	62	9	19	17	71	172	7	74	4	890
Antelope	3	5	4	10	12	82	236	28	46	13	21	3	2	3	5	1	474
Grouse			9	2					44			6	7				68
Sage Grouse	29	25	675	2,818	75			95		342		1,527	884			5	6,475
Dove			5		17					44	33			7	4	2	112
Goose/Duck						456								81			537
Cottontail						279					146						425
Rock Collecting	355			412	14	700		225	273	231				48			2,258
Fishing: Stream	30	42	6,051	4,488					48			3,987	6,570	2,037	1,500	34	24,787
Floatboat/Canoe	117	33	228	147		1,230			17			149	351	236	806		3,314
Reservoir						7,679								842			8,521
Boating						1,100								248			1,348
Waterskiing						78								128			206
Swimming						132								8			140
Snowplay	56	56	222									28				139	501
Cross-Country Skiing			92	2								15					109
Snowmobile			111			28					390	199					728
Sightseeing: Highway	60		180	210		946				752	705	180		598	230	133	3,994
Sightseeing: General	85	28	967	2,686	771	764	549	419	395	80	1,600	2,397	3,467	9,054		13	23,275
TOTAL USE	1,581	332	31,419	22,400	1,228	78,308	1,600	1,374	1,535	2,365	6,817	20,022	21,585	95,308	4,037	599	290,510

Wilderness Resource

Potential impacts to the wilderness resource would result from the proposed range improvements. Where these potential impacts exist, implementation of these components of the alternative would be postponed until the studies and public meetings required under the Federal Land Policy and Management Act (FLPMA) have been completed.

Livestock Grazing

Reduction in livestock grazing would give a short-term use of 74,613 AUMs (62,010 AUMs Federal), as compared to the proposed action's 125,500 (Federal and nonfederal). In the long term there would be a potential for 99,846 AUMs of use.

This loss of AUMs would cause an ultimately greater reduction in the overall ranch operations than just the loss of feed (Heady et al. 1974). This would cause some operators to adjust their year-round operations by reducing herd numbers and/or purchasing additional forage. Other operators could be forced out of the livestock business.

The economic impact could be severe on those operators who would lose large numbers of AUMs or are forced out of business. This impact is discussed in more detail in the socioeconomic analysis.

The potential regaining of AUMs by the end of the long term cannot be analyzed for its impact since it is not known which operators, if any, would be forced out of business. This use would be restored (up to 50%) only if monitoring studies on the range condition and trend, forage production, erosion condition, and sediment would show it is warranted. These studies would be in addition to those normally done under the proposed action. The use on TABLE 8-80 was shown for purposes of analysis and calculation.

Farming

The reduction of livestock grazing on NRL would result in greater utilization of the private lands used for hay production. It would be expected that some hayland would be converted to pasture land, resulting in less hay produced. Approximately 20% of the acreage producing hay in the Sandy area is controlled by 16 of the 48 permittees on the Sandy area. The remaining 32 permittees have base properties outside the Sandy area, some of which is used for hay production. Local consumption of the hay grown in the Eden Vallëy could increase if hayland would be converted to pasture land. Presently approximately 50% of the hay produced in the Eden Valley is sold elsewhere.

Socioeconomic Conditions

This alternative would have several major impacts to ranchers of the Sandy area. By Year 23, they would lose the availability of 49,404 AUMs per year. This would cause a loss of annual total income in the region of $1,046,130. Some ranchers could be forced to make significant changes in their operations or be forced out of the livestock business. Recreation income would increase by $473,106 per year. Construction costs would total $408,586 per year for seven years.

See APPENDIX 3E and the Chapter 3 socioeconomic condition section for methodologies used in this analysis.

ALTERNATIVE 6-SITE-SPECIFIC SUGGESTIONS

DESCRIPTION

Analysis of the proposed action indicated that certain suggested changes on site-specific areas would benefit particular environmental components in the Sandy area. This alternative proposes such changes in the proposed action. The boundaries of allotments and pastures would be the same as the proposed action (MAP 1-3).

Treatment E (graze until seedripe, then rest) would replace Treatment A (graze season long) in the three-pasture rest-rotation systems proposed for pastures with wildlife crucial winter habitat. These are Pastures 1, 2, and 3 of the Little Sandy-Little Prospect and Prospect Mountain Allotments, all pastures of the Little Colorado Allotment's Big Sandy and Farson Use Areas, and all pastures of the Sands, Reservoir, and Poston Allotments.

Grazing would be discontinued in any year when 70 to 75% utilization of the key species in the meadow types would be reached in the pastures under alternately grazed systems. This is designed to avoid the 90% utilization impact identified in Chapter 3 Vegetation, Three-Pasture Rest-Rotation System. These are Pastures 4 and 5 of the Little Sandy-Little Prospect, White Acorn, and Prospect Mountain Allotments. If this degree of utilization is reached, the livestock would be completely removed from the allotment so that the alternate pasture can receive its proper rest. In the Gold Creek Allotment, this utilization would be measured only on the two upper elevation pastures (Pastures 2 and 4). When the 70 to 75% degree of utilization is reached, the livestock could be put in Pastures 1 or 3 if the forage is available. Otherwise, they would be removed from the allotment. Tufted hairgrass *(Deschampsia* caespitosa) would be the key forage species in monitoring the extent of utilization in these pastures.

Grazing systems for the other allotments would be as stated in the proposed action (TABLE 1-4). Management and use levels stated in the proposed action would be the same for this alternative; only the amount of time livestock would be grazed in the pastures would change.

The waters in TABLE 8-87 would be constructed. Other waters would not be constructed as proposed (TABLE 1-13) to discourage livestock use of some wildlife crucial winter habitat. Fences would be constructed as proposed (TABLES 1-13 and 1-14).

Range supervision for this alternative would involve BLM employees making routine allotment inspections to ensure that:

1. Control of livestock is within the prescribed season and area of use.
2. Livestock are distributed among water developments.
3. Operators have complied with trailing requirements.
4. Unauthorized use by livestock from adjacent allotments would be controlled. Administrative actions related to unauthorized use (trespass) would be taken in accordance with BLM Manual 9230.

ANALYSIS OF ALTERNATIVE 6 IMPACTS

Impacts on the existing environment's resources and land uses that would or could occur as a result of implementation of this alternative are analyzed in two stages: short term (eleven years following completion of this statement) and long term (23 years following completion of this statement). The analysis follows the same general pattern used to analyze the proposed action.

Soils

Sheet Erosion

The same increases in vegetal cover would be anticipated under this alternative as under the proposed action and would result in reduction of the estimated sheet erosion rate for the Sandy area by 1,452,657 tons per year to about 6,925,953 tons per year in 23 years (TABLE 3-2). Other Chapter 3 soils analysis of sheet erosion would be applicable to this alternative.

Wind Erosion

The wind erosion currently occurring is expected to respond inversely to the vegetal cover (Humphrey 1962). Since the vegetal cover would be expected to increase, the amount of wind erosion would be expected to decrease. The amount is not quantifiable at this time as studies are not available upon which to base the calculations.

Compaction

The relative degree of livestock use under this alternative was estimated using a technique similar to that used in Chapter 2 (APPENDIX 2D). TABLES 8-88 and 8-89 portray the expected relative degree of use seasonally, after eleven years, and after 23 years. TABLE 8-89 shows an increase in acres effectively used by livestock (acres in the light, moderate, heavy, and severe intensity classes) from 918,463 acres presently to 1,048,551 acres over the short term and 1,122,392 over the long term. This increased acreage would be a result of the increased available water that would be supplied by this action in the Little Colorado, Red Desert, and Continental Peak Allotments. Another factor of influence was an assumption that due to the increased animals per unit when grazing occurs, the livestock would travel farther from water. This assumption was based on the generally accepted and stated conclusion that grazing systems increase distribution and/or provide more uniform use (Stoddart, Smith, and Box 1975). In either case, the relative amount of time an animal spends near water would be reduced until the previous maximum is reached. Areas previously unaffected would receive more livestock use under this alternative because it is assumed that livestock would have to travel farther to water.

In most allotments, the acreages in the heavy and severe intensity of use categories are estimated to increase since the proposed livestock use would be much higher at the end of 23 years than at the present (TABLE 8-89). However, the predicted increase in ground cover would tend to mitigate this high level of use on soil productivity. In allotments where the use would be much greater than is presently occurring, such as the Red Desert and Little Colorado Allotments, there would be increased use on a significant number of acres. TABLE 3-4 shows the relative amount of use in each of the categories that would occur under this alternative.

Water Resources

Water Use

Water use by livestock would be the same as discussed in Chapter 3. Evaporation losses from the three proposed reservoirs would be insignificant.

Streamflow

This alternative would have an unmeasurable effect on streamflow in perennial streams within or downstream from the Sandy area. Changes in runoff from Alternative 6 would have no measurable effect on annual perennial streamflow.

Storm runoff would increase 10% at the end of eleven years. Storm runoff would increase above existing levels (TABLE 8-90) in eleven years in the Gold Creek, Little Sandy-Little Prospect, Bush Rim, and Pine Creek Allotments and the Farson and Big Sandy Use Areas of the Little Colorado Allotment due to an increase in severe, heavy, moderate, and light intensity of use acres in these allotments. However, storm runoff would decrease 15% below existing levels by the end of 23 years (TABLE 8-90) due to a projected long-term increase in vegetal cover and increased infiltration rates during the Treatment C (rest season long) cycle (Gifford and Hawkins 1976).

Runoff would increase above existing levels around proposed water developments. These areas are presently receiving little grazing use by livestock. Grazing intensi-

TABLE 8-87

PROPOSED WATER DEVELOPMENTS UNDER ALTERNATIVE 6

Allotment	Earthfill Reservoirs	Wells
Little Colorado		23
Red Desert		6
Continental Peak	3	5
TOTAL	3	34

TABLE 8-88

PROJECTED SEASONAL ACRES OF GRAZING INTENSITY UNDER ALTERNATIVE 6

Allotment	Marginal to Slight	Light	Moderate	Heavy	Severe	Total Acres
Bar X	415	4,839	1,161	331	149	6,895
Fish Creek	0	3,690	2,466	731	350	7,237
Gold Creek	0	15,981	10,376	2,871	1,297	30,525
Little Sandy-Little Prospect	41,580	101,824	30,500	8,252	3,504	185,660
Steamboat Mountain	24,522	13,586	1,841	434	154	40,537
Little Colorado:						
Green River Use Area	181,460	69,655	37,240	10,606	4,830	303,791
Farson Use Area	101,101	64,713	27,629	7,979	3,701	205,123
Big Sandy Use Area	88,446	94,395	24,888	7,088	3,225	218,042
Red Desert	169,149	28,764	31,666	10,595	5,201	245,375
Bush Rim	38,119	50,861	11,362	2,984	1,221	104,547
Continental Peak	30,114	39,578	13,656	3,629	1,501	88,478
Pacific Creek	38,451	134,627	21,828	5,670	2,280	202,856
Sands	72,648	31,071	8,249	2,078	806	114,852
White Acorn	11,174	17,177	13,033	3,713	1,697	46,794
Prospect Mountain	7,489	45,398	10,135	2,652	1,077	66,751
Reservoir	9,824	19,513	4,377	1,255	576	35,545
Poston	9,350	29,686	8,176	2,344	1,079	50,635
Pine Creek	2,828	8,103	2,284	615	259	14,089
TOTAL	826,670	773,461	260,867	73,827	32,907	1,967,732

TABLE 8-89

PROJECTED SHORT-TERM AND LONG-TERM ACRES OF GRAZING INTENSITY UNDER ALTERNATIVE 6

	Short-Term Mean					Long-Term Mean					
Allotment	Marginal to Slight	Light	Moderate	Heavy	Severe	Marginal to Slight	Light	Moderate	Heavy	Severe	Total Acres
Bar X	415	4,839	1,161	331	149	415	4,690	1,259	363	168	6,895
Fish Creek	0	5,611	1,160	324	142	0	5,291	1,388	387	171	7,237
Gold Creek	65	24,042	4,667	1,235	516	0	20,317	7,347	1,990	871	30,525
Little Sandy-Little Prospect	46,754	114,941	17,399	4,638	1,928	41,580	113,084	22,539	5,982	2,475	185,660
Steamboat Mountain	24,522	13,586	1,841	434	154	21,115	15,895	2,673	631	223	40,537
Little Colorado:											
Green River Use Area	181,460	89,301	23,743	6,492	2,795	181,461	69,319	37,478	10,672	4,861	303,791
Farson Use Area	101,100	79,250	17,613	4,951	2,209	101,101	65,877	26,811	7,743	3,591	205,123
Big Sandy Use Area	99,707	96,444	15,747	4,299	1,845	88,446	98,017	22,327	6,358	2,894	218,042
Red Desert	169,149	43,146	23,229	6,721	3,130	169,147	37,924	26,899	7,781	3,624	245,375
Bush Rim	44,744	50,381	6,916	1,790	716	38,263	53,662	9,267	2,397	958	104,547
Continental Peak	30,115	47,220	8,141	2,135	867	30,116	46,030	9,010	2,362	960	88,478
Pacific Creek	77,367	107,714	13,165	3,325	1,285	50,587	129,531	16,738	4,296	1,704	202,856
Sands	82,227	25,958	4,975	1,229	463	73,125	30,817	8,084	2,037	789	114,852
White Acorn	11,176	25,564	7,196	1,988	870	11,176	24,939	7,643	2,112	924	46,794
Prospect Mountain	20,275	39,206	5,344	1,378	548	13,506	43,994	6,802	1,752	697	66,751
Reservoir	15,047	16,613	2,772	772	341	12,861	18,244	3,168	883	389	35,545
Poston	11,711	31,706	5,175	1,424	619	9,613	32,845	5,863	1,613	701	50,635
Pine Creek	3,347	8,831	1,390	369	152	2,828	8,579	1,940	522	220	14,089
TOTAL	919,181	824,353	161,634	43,835	18,729	845,340	819,055	217,236	59,881	26,220	1,967,732

TABLE 8-90

MODEL STORM RUNOFF IN ACRE-FEET BY ALLOTMENT UNDER ALTERNATIVE 6
(10 YEAR STORM)

Allotment	Existing	Short Term	Long Term
Bar X	1.5	1.5	0.5
Fish Creek	0.9	0.9	0.4
Gold Creek	16.5	16.9	13.9
Little Sandy-Little Prospect	45.1	83.5	66.9
Steamboat Mountain	120.8	119.2	101.5
Little Colorado Green River Area	14.7	11.6	8.9
Farson Area	14.7	19.2	14.7
Big Sandy Area	14.7	14.9	11.3
Red Desert	17.1	14.7	12.3
Bush Rim	66.9	82.9	66.7
Continental Peak	82.9	79.8	63.3
Pacific Creek	58.2	51.2	34.6
Sands	2.0	0.7	0.5
White Acorn	12.8	12.5	8.4
Prospect Mountain	11.4	8.9	5.7
Reservoir	22.9	19.4	14.4
Poston	15.5	12.5	10.5
Pine Creek	2.2	2.3	1.3
WEIGHTED MEAN	29.5	32.5	25.2
Percent Change		+10%	-15%

ty decreases as the distance from water increases (Mueggler 1965). Infiltration rates decrease as intensity of livestock use increases (Gifford and Hawkins 1976).

Water Quality

This alternative would have no measurable effect on water quality in perennial streams within the Sandy area or downstream. Sediment yield in the intermittent streams in the Sandy area would decrease proportionally to the decrease in storm runoff (TABLE 8-90). However, sediment transport would remain static in the Farson Use Area through the long term. Sediment yield increases proportionally to discharge (FIGURES 2-12 and 2-13). Since only relative changes in runoff were calculated, it is not possible to find actual sediment yield figures under this alternative.

Sediment yield would increase proportionally to runoff (TABLE 8-90) on Gold Creek, Little Sandy-Little Prospect, Bush Rim, and Pine Creek Allotments and the Farson and Big Sandy Use Areas of the Little Colorado Allotment at the end of eleven years due to an increase in runoff. However, sediment yield would decrease below existing levels by the end of 23 years due to a projected increase in vegetal cover. Sediment yield would increase proportionally to the increased runoff around the proposed water developments due to increased grazing intensity. Sediment yield would increase downstream from the proposed reservoirs due to headcutting if these reservoirs were not maintained (MAP 1-5).

It is estimated that all three earthfill type reservoirs would create some degree of headcutting and channel degradation during the project life if they were not maintained. The headcutting would increase sediment loads, thus degrading water quality. The degree of impact is impossible to quantify at this time as it depends on the soil type, the magnitude of discharge for each site, and the specific design of each reservoir (Chapter 3 water resources). Channel stability would generally not change in the Sandy area. However, channel stability would decrease and bank erosion increase in the Gold Creek, Continental Peak, Pacific Creek, Prospect Mountain, and Pine Creek Allotments (TABLE 8-91). This is due to an increase in livestock grazing intensity along streams during the grazing period (TABLE 8-92). Channel stability would be expected to decrease or remain static in the custodial pastures.

Salinity levels would increase on the Gold Creek, Little Sandy-Little Prospect, Bush Rim, and Pine Creek Allotments and the Farson and Big Sandy Use Areas of the Little Colorado Allotment during the first eleven years due to a projected increase in sediment yield. However, salinity levels would decrease below existing levels during the next twelve years due to a decrease in sediment yield. Salinity levels would increase around the proposed water developments because of a projected increase in sediment yield. This effect would last for the life of the individual project. Salinity would increase below the proposed reservoirs due to headcutting. Fecal coliforms (indicators of bacteriological contamination) from livestock grazing on NRL would be reduced below existing levels.

Vegetation

Sagebrush-Grass Type

All allotments under this alternative have sagebrush-grass types. The treatments would still afford the same benefits as described in Chapter 3 under vegetation. The phenological requirements of the plants would be met on a rotation basis with Treatments B and C. By replacing Treatment A with Treatment E, utilization would decrease in the early-grazed pasture and increase in the late-grazed pasture. The decrease in utilization under Treatment E would be a benefit as this is the period when most plants grazed by livestock would be most harmed and vigor of the plants would be reduced. This late-season rest should provide for an increase in litter in these pastures which could lead to improved range condition. By providing this rest, any detrimental effects from the heavy utilization required under Treatment B could be offset.

Heavier utilization would occur in the Treatment B pasture in all cases. The plants would have matured and completed growth requirements. Grazing at this point does little harm to the plants other than trampling damage. The total AUMs needed to be utilized from the pastures under Treatment B would increase, ranging from 11 to 49% (TABLE 8-93).

The number of AUMs required with Treatment B in the Little Sandy-Little Prospect and Big Sandy Use Area of the Little Colorado Allotment would approach the total forage produced which would be usable by livestock (TABLE 8-94). This would create severe grazing and significant trampling damage.

Forage Production. Forage production would be the same as described in Chapter 3.

Range Condition and Trend. Range condition improvements should be the same as the proposed action except that expected improvement could be slower in the Little Sandy-Little Prospect Allotment and Big Sandy Use Area of the Little Colorado Allotment because of the excessive heavy utilization that could occur under Treatment B.

Greasewood Type

The Big Sandy Use Area of the Little Colorado Allotment is the only area with this type. The impacts would be the same in this type as that described in the proposed action. Utilization would be heavier under Treatment B as explained under the sagebrush-grass type analysis. Forage production, range condition, and trend would be the same as described in Chapter 3.

TABLE 8- 91

PROJECTED CHANNEL STABILITY RATING
UNDER ALTERNATIVE 6*

Allotment	Stream Miles	Present	Potential	23 Years Future
Bar X	9.00	99.0	79.0	93.7
Fish Creek	5.50	92.4	83.5	89.9
Gold Creek	39.00	95.6	90.2	96.1
Little Sandy-Little Prospect	42.25	103.3	91.5	100.3
Steamboat Mountain	9.50	110.0	89.0	89.0
Little Colorado				
Green River	30.00	85.9	77.7	85.2
Big Sandy	30.25	102.2	94.6	99.9
Continental Peak	6.25	99.0	79.0	100.0
Pacific Creek	48.00	106.9	92.2	113.2
White Acorn	22.75	95.9	81.1	95.7
Prospect Mountain	24.75	103.1	98.2	103.2
Reservoir	14.50	111.0	111.0	111.0
Poston	3.00	104.0	104.0	101.9
Pine Creek	10.50	97.2	92.4	97.7
WEIGHTED MEAN		100.0	90.0	99.8

TOTAL MILES 295.25

* Channel Stability Rating	Condition
38	Excellent
39-76	Good
77-95	High Fair
96-114	Low Fair
115+	Poor

TABLE 8-92

RELATIVE GRAZING INTENSITY 100 YARDS FROM WATER
UNDER ALTERNATIVE 6

Allotment	Existing	Short-Term
Bar X	92	82
Fish Creek	65	66
Gold Creek	44	39
Little Sandy-Little Prospect	59	57
Steamboat Mountain	7	4
Little Colorado		
Green River Use Area	60	78
Farson Use Area	60	66
Big Sandy Use Area	60	59
Red Desert	3	77
Bush Rim	1	40
Continental Peak	35	50
Pacific Creek	10	30
Sands	15	32
White Acorn	45	61
Prospect Mountain	42	36
Reservoir	67	85
Poston	49	65
Pine Creek	35	53
WEIGHTED MEAN	38	57
Percent Change		+50%

See APPENDIX 2D for detailed information.

TABLE 8-93

AUMS UTILIZED UNDER TREATMENT B

Allotment	Present Use	Alternative 6	Percent Increase
Little Sandy-Little Prospect	4,909	6,894	40%
Little Colorado			
Big Sandy Use Area	6,147	9,181	49%
Farson Use Area	6,820	7,538	11%
Sands	2,025	2,544	26%
Prospect Mountain	1,664	2,452	47%
Reservoir	1,179	1,508	28%
Poston	2,075	2,619	26%

TABLE 8-94

FORAGE AVAILABILITY AND USE BY ALLOTMENT WITH TREATMENT E UNDER ALTERNATIVE 6

Allotment	Proper Use Capacities in AUMs: Cattle	Sheep	Wild-Life	Proposed Livestock Use 3/ in AUMs: Year 1 Present Use2/	Year 1 Alter-tive 6 2/	Year 2 Present Use2/	Year 2 Alterna-tive 6 2/	Year 3 Present Use2/	Year 3 Alterna-tive 6 2/	Actual Wildlife Use2/
Little Sandy-Little Prospect										
Pasture 1	3,069	3,783		(B) 4,909	(B) 6,894	(C) 0	(C) 0	(A) 4,909	(E) 2,924	
2	4,261	5,190		(A) 4,909	(E) 2,924	(B) 4,909	(B) 6,894	(C) 0	(C) 0	
3	4,541	5,254		(C) 0	(C) 0	(A) 4,909	(E) 2,924	(B) 4,909	(B) 6,894	
4	1,472	1,707		(A) 2,794	(A) 2,794	(C) 0	(C) 0	(A) 2,794	(A) 2,794	
5	1,198	1,422		(C) 0	(C) 0	(A) 2,794	(A) 2,794	(C) 0	(C) 0	
Total	14,541	17,356	59,822	12,612	12,612	12,612	12,612	12,612	12,612	969
Little Colorado										
Big Sandy Use Area										
Pasture 1	3,115	3,534		(A) 6,146	(E) 3,112	(B) 6,147	(B) 9,181	(C) 0	(C) 0	
2	3,668	4,075		(B) 6,147	(B) 9,181	(C) 0	(C) 0	(A) 6,146	(E) 3,112	
3	3,719	3,934		(C) 0	(C) 0	(A) 7,243	(E) 4,209	(B) 6,147	(B) 9,181	
	10,502	11,543	25,122	12,293	12,293	13,390	13,390	12,293	12,293	1,224
Farson Use Area										
Pasture 1	3,906	3,874		(A) 6,819	(E) 6,101	(B) 6,820	(B) 7,538	(C) 0	(C) 0	
2	4,160	4,302		(B) 6,820	(B) 7,538	(C) 0	(C) 0	(A) 6,819	(E) 6,101	
3	4,936	5,177		(C) 0	(C) 0	(A) 6,819	(E) 6,101	(B) 6,820	(B) 7,538	
	13,002	13,353	15,958	13,639	13,639	13,639	13,639	13,639	13,639	805
Prospect Mountain 1/										
Pasture 1	885	986		(B) 1,664	(B) 2,452	(C) 0	(C) 0	(A) 1,664	(E) 1,145	
2	1,232	1,579		(A) 1,664	(E) 1,145	(B) 1,664	(B) 2,452	(C) 0	(C) 0	
3	779	991		(C) 0	(C) 0	(A) 1,664	(E) 1,145	(B) 1,664	(B) 2,452	
4	930	920		(A) 1,356	(A) 1,087	(C) 0	(C) 0	(A) 1,356	(A) 1,087	
5	679	686		(C) 0	(C) 0	(A) 1,356	(A) 1,087	(C) 0	(C) 0	
	4,505	5,162	17,453	4,684	4,684	4,684	4,684	4,684	4,684	2,521
Sands										
Pasture 1	1,638	2,166		(A) 2,025	(E) 1,506	(B) 2,025	(B) 2,544	(C) 0	(C) 0	
2	2,099	2,102		(B) 2,025	(B) 2,544	(C) 0	(C) 0	(A) 2,025	(E) 1,506	
3	1,738	2,145		(C) 0	(C) 0	(A) 2,025	(E) 1,506	(B) 2,025	(B) 2,544	
	5,475	6,413	31,857	4,050	4,050	4,050	4,050	4,050	4,050	1,077
Reservoir										
Pasture 1	481	689		(B) 1,179	(B) 1,508	(C) 0	(C) 0	(A) 1,179	(E) 850	
2	615	872		(C) 0	(C) 0	(A) 1,179	(E) 850	(B) 1,179	(B) 1,508	
3	528	736		(A) 1,179	(E) 850	(B) 1,179	(B) 1,508	0	0	
	1,624	2,297	6,150	2,358	2,358	2,358	2,358	2,358	2,358	730
Poston										
Pasture 1	1,083	1,439		(B) 2,075	(B) 2,619	(C) 0	(C) 0	(A) 2,074	(E) 1,530	
2	1,168	1,577		(A) 2,074	(E) 1,530	(B) 2,075	(B) 2,619	(C) 0	(C) 0	
3	870	1,261		(C) 0	(C) 0	(A) 2,074	(E) 1,530	(B) 2,075	(B) 2,619	
	3,121	4,277	10,712	4,149	4,149	4,149	4,149	4,149	4,149	243

1/ Utilization would be limited to 70%-75% on tufted hairgrass in the meadows of Pastures 4 and 5, then livestock would be moved out of pasture.

2/ (A), (B), (C), or (E) indicate treatment used.

3/ Use would be the same as the proposed action.

Meadow Type

The meadow type occurs in all allotments except the Farson Use Area of the Little Colorado Allotment. The impacts of this alternative would be the same as described in Chapter 3 except that utilization would be limited to about 75% in Pastures 4 and 5 of the Little Sandy-Little Prospect, White Acorn, and Prospect Mountain Allotments and all pastures of the Gold Creek Allotment. Limiting utilization should reduce the excessive trampling by livestock in the wet meadow areas.

Increased utilization would occur under Treatment B in the three-pasture rest-rotation areas. This would be the same as explained under the sagebrush-grass type. Utilization of the meadows would be severe in the pastures scheduled for Treatment B of the Little Sandy-Little Prospect Allotment and the Big Sandy Use Area of the Little Colorado Allotment.

Grass Type

This type occurs only in the Big Sandy and Farson Use Areas of the Little Colorado Allotment. The impacts would be the same as described in Chapter 3 except for the increased utilization under Treatment B.

Mountain Shrub Type

This type occurs only in the Little Sandy-Little Prospect and Prospect Mountain Allotments. The impacts would be the same as described in Chapter 3 except for the increased utilization under Treatment B.

Conifer Type

This type is in the Prospect Mountain Allotment. The impacts would be the same as described in Chapter 3 except for the increased utilization under Treatment B.

Wildlife

Terrestrial

Pronghorn. The pronghorn populations would be expected to stabilize in the short-term at levels between 3% above (approximately 9,900) and 20% below current numbers (approximately 7,680) under this alternative. This potential decrease could occur if a severe winter was experienced such as the 1971-72 season. The pronghorn would be expected to build back to the desired level of 9,900 (3% above current numbers). The rate of increase would depend largely on weather conditions, mainly during the winter, as this is when most mortality occurs.

Food, Water, Cover, and Space. The forage cover and carrying capacity should increase in five allotments which contain 75% of the pronghorn crucial winter habitat and where Treatment E would replace Treatment A. Restriction of water development on crucial winter habitat would limit livestock, wild horse, and wildlife summer use of winter forage. The predicted increase in forage production would also be expected to enhance the forage and cover carrying capacity.

However, increased livestock use because of activated nonuse would be expected to be a drawback in four allotments which contain 67% of the crucial winter habitat. Increased use would allow removal of present excesses of forage and cover which could otherwise give additional support during more severe winters.

An increase in the forage and cover carrying capacity would decrease the amount of space required each year for survival. However, the 536 miles of proposed fencing would limit freedom of movement during migration and in and around crucial winter habitat. The severity of this problem would depend on the severity of winter, snow depth, and crusting conditions of snow. It is believed that the drawbacks from fencing would be serious and more than offset any increases in the carrying capacity. See Chapter 3 wildlife section for a discussion of fence impacts on antelope.

Mule Deer. The effects of this alternative would be to maintain or increase the carrying capacity of the mule deer crucial winter habitat through both the short and long terms. The population would be expected to stabilize in the short term at levels between current numbers (approximately 5,200) and 43% above current numbers (approximately 7,400), which would be the population desired by the WGFD.

Food, Water, Cover, and Space. Treatment A would be replaced by Treatment E in four allotments containing 50% of the mule deer crucial winter habitat. This would reduce the duration of livestock use, particularly on shrubs, and increase the food, cover, and carrying capacity. Restriction of water development within crucial winter habitat would limit summer livestock, wild horse, and big game use of winter forage. The predicted increase in forage production (TABLES 2-24 and 8-94) would also be expected to enhance the forage, cover, and carrying capacity.

Increased livestock use due to activated nonuse would be expected to impact deer in four allotments containing 57% of the crucial winter habitat. Increased use would allow removal of present excesses of forage and cover which could give additional support during more severe winters. The freedom of movement (available space) would be decreased since 52% of the proposed fencing (281 miles) would be constructed in the allotments and use areas containing crucial mule deer winter habitat.

Elk. The effects of this alternative would be to maintain the carrying capacity of the elk crucial winter habitat through both the short and long terms. The elk population would be expected to maintain current numbers of approximately 1,200 animals.

Food, Water, Cover, and Space. Treatment A would be replaced by Treatment E in four allotments containing 50% of the elk crucial winter habitat. This would reduce the duration of livestock use, particularly on shrubs, and increase the food, cover, and carrying capacity. Restriction of water development within crucial winter habitat

would limit summer livestock, wild horse, and big game use of winter forage. The predicted increase in forage production (vegetation section) would also be expected to enhance the forage, cover, and carrying capacity.

Increased livestock use due to activated nonuse would be expected to impact elk in four allotments containing 50% of the crucial winter habitat. Increased use would allow removal of present excesses of forage and cover, which could give additional support during more severe winters. The freedom of movement (available space) would be affected since 55% of the fencing (296 miles) would be constructed in the allotments containing elk crucial winter habitat.

Moose. The effects of this alternative would be to slightly decrease the carrying capacity of the moose crucial winter habitat in both the short and long terms. The moose population would be expected to stabilize in the short term at levels between current numbers of 55 and 60 and 5% below current numbers. During severe winters such as 1948-49 and 1971-72, populations could drop significantly below current levels.

Food, Water, Cover, and Space. Treatment A would be replaced by Treatment E in six allotments containing 50% of the moose crucial winter habitat. This would reduce the duration of livestock use, particularly on shrubs, and increase the winter food, cover, and carrying capacity. The predicted increase in forage production (vegetation analysis) would also be expected to enhance the forage, cover, and carrying capacity.

Increased livestock use due to activated nonuse would be expected to impact moose in three allotments containing 25% of the crucial winter habitat. Increased use would remove present excesses of forage and cover, which could give additional support during more severe winters.

The freedom of movement (available space) would be decreased since 53% of the fencing (286 miles) would be constructed in allotments containing moose crucial winter habitat.

Sage Grouse. This alternative would increase the carrying capacity of sage grouse habitat considerably throughout the short and long terms. The population would probably stabilize within the long term at levels between 1 and 15% greater than current numbers. No population estimates are available; however, sage grouse are considered to be common to abundant (per. comm., Lockman 1977) in the Sandy area.

Food, Water, Cover, and Space. Treatment A would be replaced by Treatment E in nine allotments containing 82% of the sage grouse crucial winter habitat. This would reduce the duration of livestock use and damage to sagebrush and increase the winter food, cover, and carrying capacity. Fencing of waters would enhance riparian vegetation growth and protect this growth and small animals from livestock use and trampling. The predicted increase in forage production (vegetation section) would also be expected to enhance the forage, cover, and carrying capacity.

Increased livestock use due to activated nonuse would be expected to impact sage grouse in eight allotments containing 62% of the crucial winter habitat. Increased use would allow removal of present excesses of forage and cover, which could give additional support during more severe winters.

Ducks. This alternative would moderately increase the carrying capacity of duck habitat throughout the short and long terms. The population would probably stabilize at levels within the long term between the current level and 10% greater. No population estimate is available; however, ducks are considered to be abundant (per. comm., Serdiuk 1977) and to be using available nesting space to the carrying capacity limits in the Sandy area.

Food, Water, Cover, and Space. Treatment A would be replaced by Treatment E in eight allotments containing 47% of the duck crucial nesting habitat. This would reduce the duration of livestock use and preserve cover qualities. Development of water, particularly earthfill reservoirs, would expand the potential breeding habitat and offer increasing amounts of cover with the development of riparian growth. The predicted increase in forage production (TABLES 2-24 and 8-94) would also be expected to enhance the forage, cover, and carrying capacity.

Increased livestock use due to activated nonuse would be expected to be a drawback on eight of the allotments containing nesting habitat. Intensified use would allow removal of present excesses of forage and cover and increase the frequency of nest trampling. The activation of current nonuse would be expected to increase the number of livestock using characteristic duck nesting locations. The competition for space would increase the frequency of nest trampling.

Nongame Species. This alternative would moderately increase the carrying capacity of nongame habitat throughout the short and long terms. The population would probably stabilize within the short term at levels between 10 and 30% greater than current numbers. No population estimates are available from the WGFD (per. comm., Lockman 1977).

Food, Water, Cover, and Space. Treatment A would be replaced by Treatment E in over 55% (approximately 1,127,000 acres) of the Sandy area. This would reduce the duration of livestock use and increase the food, cover, and carrying capacity. Development of waters would expand the potential habitat. The predicted increase in forage production (TABLES 2-24 and 8-94) would also be expected to enhance the forage, cover, and carrying capacity.

Increased livestock use due to activated nonuse would be expected to be a significant drawback on over 75% (approximately 1,524,000 acres) of the Sandy area. Increased use would allow removal of present excesses of forage and cover, which could give additional support during more severe winters. Most of the removal would occur in the southern portions of the Sandy area which accommodates the greatest number of nongame animals. Also, as present nonuse is activated, there would be habitat quality decreases and ecological alterations which would be expected to alter nongame numbers and diversity.

Space. The activation of current nonuse would be expected to increase the number of livestock. The competition for space would increase the frequency of nest and young trampling.

Threatened and Endangered Species.

Peregrine Falcon. This alternative would tend to highly increase the forage carrying capacity of peregrine habitat throughout the short and long terms. The peregrine population would probably tend to increase within the long term. Any enhancement of ducks and certain nongame species which would result in increasing their populations would increase the potential hunting success of peregrine falcons and tend to increase falcon numbers in the Sandy area.

The critical time of nest disturbance would be the first three months following livestock release. The increased livestock use due to the activation of current nonuse would also be expected to increase the number of livestock and range rider disturbance. This disturbance could increase the frequency of nest abandonment.

Black-Footed Ferret. It is felt that this alternative would tend to moderately increase the carrying capacity for black-footed ferrets in both the short and long terms. The ferret population would probably tend to increase within the long term. Any enhancement and resultant increase of potential prey species, most of which would be nongame animals, would increase the potential hunting success of ferrets and tend to increase their numbers in the Sandy area. An increase in prey populations could be beneficial in terms of space by promoting greater hunting success within a smaller area.

Aquatic

As proposed under this alternative, substituting a graze until seedripe treatment for the season long grazing associated with Treatment A would be expected to result in approximately 30% less intensive use along aquatic habitat areas. This would also be expected to leave additional streambank vegetation for protection from erosion during spring runoff the following year. The additional half of a season's rest provided by this alternative would reduce the degree of use on streambank willows, allowing for a somewhat improved or faster recovery rate and long-term improvement in bank stability. The overall habitat condition anticipated for the short term in TABLE 3-44 would probably still prevail. However, from this point through the long term, stream habitat conditions would generally be anticipated to begin and continue a gradual improvement trend. A detailed analysis of habitat conditions is available for review upon request from the Rock Springs District Office.

Modification of the proposed two-pasture alternately grazed systems to limit utilization to 70 to 75% in meadow or riparian areas would be expected to leave some residual bank vegetation for erosion protection. Stream habitat conditions would be anticipated to attain the short -term conditions predicted in TABLE 3-44 and possibly maintain these conditions through the long term. (See TABLE 3-45 for long-term comparison.) While bank vegetal cover, particularly by grasses and forbs, would be anticipated to improve under this alternative, physical trampling damage would be the primary limiting factor for aquatic habitat. Increased sedimentation and reduced cover due to accelerated bank erosion would be the primary changes which would occur.

One year's rest would not be anticipated to result in any appreciable degree of recovery for stream habitat during the period of rest. As noted earlier, initial bank recovery, vegetatal accumulations, and stabilization would begin to benefit stream habitat at or near the end of the year's rest. Upon this stabilizing condition, grazing use would be indicated once again the following spring, resulting in a very slow or minimal improvement for stream habitat elements.

Wild Horses

Impacts on the wild horses would be the same as discussed in Chapter 3, except for three proposed wells in the Bush Rim Allotment that would not be drilled under this alternative. Utilization of the areas that would have been made available by the wells would be limited and would occur only in the fall when snow is available. Horses could still make use of these areas because of their ability to move farther from water in search of forage.

Cultural Resources

Treatment E would have the same impacts on artifacts as those described in Chapter 3. Trampling would lead to the breakage and relocation of artifacts. The proposed wells and reservoirs would also have the same impacts as discussed in Chapter 3.

A proposed reservoir is within one-fourth of a mile of the Lander-Pinedale Trail of the Little Sandy-Little Prospect Allotment (NWNW S26,T28,R103W). This project would have an adverse impact upon historical resources by disturbing historic remains or settings. None of the specific locations that are eligible for inclusion on the National Register would be affected by any of the proposed projects.

Visual Resources

The visual effects of Alternative 6 are site-specific and are related to water project developments, fencing, and concentrated trampling in stream bottoms and around water developments. For the most part these effects currently exist throughout the landscape and represent addition of a commonly occurring visual effect. Change in the visual resource for the area as a whole would be very minimal in most instances.

The proposed projects were examined using the contrast rating system and regardless of site or type of effect are exactly the same as shown on TABLE 3-58 except that the significant impacts shown are considered miti-

gated as in Chapter 4; hence no significant impacts occur.

Recreation

Alternative 6 would have a measurable effect only in the Gold Creek Allotment. Visitor use in the allotment would be affected for the recreation activities shown in TABLE 8-95.

This change would result in a corresponding change to the totals for the Gold Creek Allotment. The total visitor use per year for the allotment would be 33,374 visitor days or 23% more visitor use per year than exists under current conditions. A detailed analysis is available for review upon request from the Rock Springs District Office.

The totals for overall changes to the activities for the Sandy area are shown in TABLE 8-96. Alternative 6 would have a total visitor use per year of 282,643 visitor days, an increase of 90% from existing use.

Soil and waterborne disease, including parasites, related to livestock grazing could be a hazard to recreation seekers. The hazard is potential and has not been quantified because of lack of data.

Wilderness Resource

Potential impacts to the wilderness resource would result from the proposed range improvements. Where these potential impacts exist, implementation of those components of the alternative would be postponed until the studies and public meetings required under the Federal Land Policy and Management Act (FLPMA) have been completed.

Livestock Grazing

Impacts to Livestock

Treatment E would require removal of all livestock from the pastures after seed ripe of the key species. This could result in a disturbance of the livestock in the Little Sandy-Little Prospect, Prospect Mountain, Sands, Reservoir, and Poston Allotments and the Big Sandy and Farson Use Areas of the Little Colorado Allotment.

Limiting utilization to about 75% on the meadows in Pastures 4 and 5 of the Little Sandy-Little Prospect, White Acorn, and Prospect Mountain Allotments and all pastures of the Gold Creek Allotment could result in livestock being totally removed from the pastures. This could also result in livestock being removed earlier than the scheduled date in the Gold Creek Allotment. Additional riding time could be used to keep cattle off the meadows, but this additional disturbance could result in reduced weight gains.

No additional waters are proposed except in the Little Colorado, Red Desert, and Continental Peak Allotments. The lack of additional developments in the other allotments would increase the amount of utilization around existing waters in those allotments. This could cause cattle to spend more time traveling to and from water to reach usable forage. This requires energy that could be converted to weight gains.

Impacts to Permittees

The impacts would be the same as discussed in Chapter 3 except for the Little Sandy-Little Prospect and Gold Creek Allotments and the Big Sandy Use Area of the Little Colorado Allotment. The AUMs needed from the pastures scheduled for Treatment B in the Little Sandy-Little Prospect Allotment and the Big Sandy Use Area could be more than would be produced. This would require a reduction in the licensed use because the majority of the use is in the fall. Five sheep permittees making full use in this area would be affected in either holding the sheep off longer or reducing numbers. The resulting impact would be significant if the permittees have to reduce numbers.

Cattle permittees in the Little Sandy-Little Prospect Allotment could have to remove their livestock earlier. Earlier removal of livestock from the Gold Creek Allotment could also result. This could result in increased maintenance cost per cow unit if additional hay would have to be purchased or private pasture would have to be rented. Additional costs would be incurred if increased riding was used to keep cattle distributed and away from meadow bottoms. Increased riding would be required to remove all cattle from the pastures scheduled with Treatment E.

Reduced costs of maintenance of range improvements would not be significant (a 3% or $2,850 reduction).

Farming

No additional impacts would result from this alternative over the proposed action on the farming activities in the area. Most livestock that would have to be removed earlier under the proposed season of use would be moved to properties outside the area.

Socioeconomic Conditions

This alternative is nearly identical to the proposal. The only impact differences would be an increase in recreation income of $589,216 per year, rancher maintenance costs of $88,359 per year, and construction costs of $317,071 per year for seven years. These impacts are increases over the existing situation.

See APPENDIX 3E and the Chapter 3 socioeconomic condition section for methodologies used in this analysis.

TABLE 8-95

CHANGES IN VISITOR USE BY ACTIVITY IN GOLD CREEK UNDER ALTERNATIVE 6

	Visitor Days Per Year	Percent Change From Existing
Hunting-Sage Grouse	712	+39%
Hunting-Dove	6	+20%
Fishing-Stream	7,119	+25%
Cross-Country Skiing	88	-15%

TABLE 8-96

CHANGES IN VISITOR USE BY ACTIVITY FOR SANDY AREA

	Number of Visitor Days	Percent Change From Existing
Hunting-Sage Grouse	6,523	+21%
Hunting-Dove	115	+17%
Fishing-Stream	25,830	+49%
Cross-Country Skiing	105	-16%

ALTERNATIVE 7-WILDLIFE AND WILD HORSE MANAGEMENT GOALS

DESCRIPTION

Based on responses received, both written and oral, the following alternative was developed cooperatively by Wyoming Game and Fish Department (WGFD) and Bureau of Land Management (BLM) personnel. Essentially the alternative stresses the need for management goals for wildlife to be incorporated into future grazing systems, project developments, and monitoring studies. These goals would be cooperatively established by the WGFD and the BLM. It also emphasizes a case-by-case approach to future actions relative to grazing management which would include wildlife habitat requirements as established in APPENDIX 8A.

Rationale for the formulation of this alternative are based on the habitat requirements of antelope, mule deer, elk, moose, sage grouse, and fish inhabiting the Sandy area; on the maintenance of habitat diversity for all wildlife; and, on the WGFD's evaluation of the proposed action and alternatives.

The proposal includes continuous monitoring studies, some wholly by BLM and some cooperatively between the BLM and WGFD. Among these are studies on allotments grazed season-long to determine if a grazing system is meeting multiple-use objectives; new determinations of carrying capacity after wildlife considerations are designed into grazing systems so that the activation of nonuse could be allowed; trends in riparian and habitat quality; and other studies. This alternative includes the following specific elements.

1. The level of livestock use through the long term would be the existing actual use of 89,382 AUMs (TABLE 8-97) and forage reservations for wild horses would be the same as for the proposed action, i.e., 9,600 AUMs, approximately 800 horses (see TABLE 1-4). Forage reservations (competitive and special) for wildlife would be 66,085 AUMs as shown on TABLE 8-97. All allotments would continue the existing actual levels of livestock use as shown on TABLE 8-97 until studies identify grazing systems which meet terrestrial and aquatic wildlife habitat objectives. Any change in management such as changing the grazing system, season of use, levels of use, etc. would be accomplished on an allotment-by-allotment basis.

The Bar X, Gold Creek, and Fish Creek Allotments, operating under existing AMPs would remain under AMPs in this alternative. Grazing systems would be designed for the remaining 15 allotments receiving season-long grazing to fulfill wildlife habitat requirements for desired population levels (see APPENDIX 8A for habitat requirements). Cooperative (WGFD and BLM) surveys would be conducted on a scheduled basis to measure the following: (1) habitat condition, (2) vegetation production and utilization, and (3) trends to accumulate information and establish carrying capacities for major wild herbivores and livestock.

2. There would only be limited livestock conversions to the extent now temporarily allowed.

3. There would be no winter sheep use from October 16 to April 15 on antelope crucial winter habitat. See MAP 2-22 for crucial habitat location.

4. No activation of nonuse would be allowed in the short term. In the long term, activation of nonuse would be allowed only after wildlife habitat considerations and objectives had been designed into the livestock grazing system and updated carrying capacity determinations were made.

5. Wildlife and free-roaming horses would be allocated forage for population level objectives and on a seasonal range basis; however, to insure that forage and cover would be available to big game species on critical winter habitat, livestock use of critical winter habitat would be minimized at a level cooperatively determined by the BLM and WGFD on a case-by-case basis. Horses would be allowed to run in the same areas as they were found in 1971.

6. One-half mile of the east boundary fence for the White Acorn Allotment, running northwest from Highway 28 in the antelope corridor, would be modified with three 200-foot drop panels (MAP 8-6). The Green River-Pinedale Resource Area's boundary fence (MAP 8-6) would be modified by the construction of ten to fifteen wing gates and removal of the bottom wire from Highway 187 west to the Green River. The Sandy Individual Use Pasture fence (MAP 8-6) would be modified from a five to a four wire fence. The above fence modifications would be accomplished in the short term in accordance with BLM Manual 1737.

7. Fencing would be limited to existing fences, the 46 riparian habitat study exclosures identified in TABLE 8-98 which were obtained from Chapter 4 mitigating measures and monitoring studies, and those around water developments. Water developments would be fenced on a case-by-case basis to partially or totally exclude livestock and/or some wildlife species. Fencing to improve and study riparian habitat would be accomplished after coordination with WGFD personnel. Forty-six riparian habitat study exclosures would be constructed in the short term (TABLE 8-98). Cooperative monitoring studies would be conducted to determine trends in riparian habitat quality. Riparian habitat would be intensively managed over the long term based on the requirements identified through the short term studies in the riparian exclosures. Herding of livestock would be practiced in the short term to reduce intensity of use in riparian areas. After the studies identified above indicate proper utilization levels herding practices would be altered as necessary.

8. Livestock or wildlife waters would not be developed on big game crucial winter habitat in the short term. An optimum distribution of livestock and wildlife water developments would be proposed on big game summer and winter habitat in the long term. For purposes of analysis it is assumed that up to 31 water developments would be constructed (see MAP 8-6) on the following allotments in the water development control area: Little Sandy (10), Little Prospect (10), Prospect Mountain (5), Sands (5), and Steamboat Mountain (1). Waters outside the control area would be also developed in the

TABLE 8-97

PROPOSED MANAGEMENT AND USE LEVELS BY ALLOTMENT UNDER ALTERNATIVE 7

Allotment And Acres	Grazing System	Class of Livestock	Season Of Use	Proposed Livestock Use In AUMs[1/]: Federal Land Use: Livestock	Federal Land Use: Trailing Use	Authorized State and Private Land Use	Total Livestock Use[2/]	Compet. Reserv. In AUMs[1/]	Wildlife[3/]: Total Allow. In AUMs[1/]	Wildlife[3/]: Compet. Reserv. In AUMs[1/]	Wild Horses[3/]: Total Allow. In AUMs[1/]	Total Forage Use In Area[4/] In Aums[1/]
1. Bar X	3-pastr.	Cattle	06/01-10/15	424		437	861	5[6/]				
6,895	Deferred	Sheep	06/01-10/15	32		38	70					
		Horses	06/01-10/15	7		10	17					
		Total		463	None	485	948	74	524	None	None	1,467
2. Fish Creek	2-pastr.	Cattle	05/16-08/17	583		231	814	83[6/]				
7,237	Deferred											
	Grazing											
		Total		583	None	231	814	6	138	None	None	869
3. Gold Creek	3-pastr.	Cattle	06/01-11/30	2,369		686	3,055	0[6/]				
24,580	Deferred											
	Grazing	Total		2,369	None	686	3,055	217	971	None	None	4,026
3a. Willow	Season	Cattle	06/01-11/30	624		143	767	0[6/]				
Creek	Long											
5,945	Grazing											
		Total		624	None	143	767	58	258	None	None	1,025
4. Little	Season	Cattle	05/01-11/15	7,578	9	984	8,571	674[6/]				
Sandy	Long	Sheep			269	311	580					
114,879	Grazing											
		Total		7,578	278	1,295	9,151	877	7,849	None	None	16,326
4a. Little	Season	Cattle	05/01-10/01	2,453	11	0	2,464	362[6/]				
Prospect	Long	Sheep	05/01-10/15	3,023	105	0	3,128					
70,781	Grazing											
		Total		5,476	116	0	5,592	237	2,304	None	None	7,534
5. Steamboat	Season	Cattle	05/01-12/15	602		199	801	1,016[6/]				
Mountain	Long	Sheep	07/01-09/12	538	100		638					
38,276	Grazing											
		Total		1,140	100	199	1,439	429	2,360	None	None	2,783
6. Little	Season	Cattle	05/01-10/31	5,438		128	5,566	18,832[6/]				
Colorado	Long	Cattle	11/01-12/15	1,747			1,747					
726,956	Grazing	Cattle	12/15-02/28	1,619			1,619					
		Sheep	04/20-04/30	77		650	727					
		Sheep	05/01-07/15	3,383			3,383					
		Sheep	07/16-08/31	123			123					
		Sheep	09/01-12/15	17,100			17,100					
		Sheep	12/16-01/31	881	On		881					
		Total		30,368	Demand	778	31,146	671	22,111	486	1,800	36,225
7. Red Desert	Season	Sheep	05/01-07/15	832		1,338	2,170	14,914[6/]				
252,229	Long	Sheep	07/16-08/31	495			495					
	Grazing	Sheep	09/01-12/15	1,933	146		2,079					
		Total		3,260	146	1,338	4,744	203	15,981	2,081	5,277	11,088
8. Bush Rim	Season	Sheep	05/01-07/15			192	192	5,534[6/]				
100,437	Long	Sheep	07/16-08/31	746			746					
	Grazing	Sheep	09/01-12/15	450	276		726					
		Total		1,196	276	192	1,664	461	7,522	504	1,340	4,992
9. Continental	Season	Sheep	05/01-07/15	2,735		740	3,475	3,678[6/]				
Peak	Long		09/17-12/15	541	58		599					
89,914	Grazing											
		Total		3,276	58	740	4,074	212	4,676	377	1,183	6,255
10. Pacific	Season	Sheep	05/01-10/31	5,331	240	1,062	6,633	7,304[6/]				
Creek	Long	Horses	05/01-12/31	689			689					
203,738	Grazing											
		Total		6,020	240	1,062	7,322	1,085	12,344	None	None	12,362
11. Sands	Season	Horses	05/01-12/31	373			373	2,656[6/]				
112,051	Long	Cattle	05/01-12/15	2,116			2,116					
	Grazing	Sheep	05/01-06/30	414	100	75	589					
		Sheep	09/13-11/30			13	13					
		Total		2,903	100	88	3,091	550	4,960	None	None	5,395

TABLE 8-97 (Continued)

PROPOSED MANAGEMENT AND USE LEVELS BY ALLOTMENT UNDER ALTERNATIVE 7

Allotment And Acres	Grazing System	Class of Livestock	Season Of Use	Proposed Livestock Use In AUMs 1/: Federal Land Use: Livestock	Federal Land Use: Trailing Use	Authorized State & Private Land Use 2/	Total Livestock Use	Wildlife 3/: Compet. Reserv. In AUMs 1/	Wildlife: Total Allow. In AUMs 1/	Wild Horses 3/: Compet. Reserv. In AUMs 1/	Wild Horses: Total Allow. In AUMs 1/	Total Forage Use In Area 4/ In Aums 1/
12. White	Season	Cattle	06/01-10/15	675	7	782	1,464	2,123 6/				
Acorn	Long	Sheep	05/01-07/15	775	349	500	1,624					
46,794	Grazing	Sheep	09/01-10/31	622			622					
		Total		2,072	356	1,282	3,710	217	3,402	None	None	4,989
13. Prospect	Season	Cattle	05/01-09/30	1,855	6	340	2,201	862 6/				
Mountain	Long	Cattle	10/01-12/31	385	5		573					
56,623	Grazing	Sheep	05/01-07/15	518	127	183	645					
		Sheep	07/16-08/31	467	80		547					
		Sheep	09/01-12/15	725			725					
		Total		3,950	218	523	4,691	396	3,809	None	None	7,638
14. Reservoir	Season	Sheep	05/01-07/15	725		515	1,240	122 6/				
35,545	Long	Sheep	07/16-08/31	744	None		744					
	Grazing	Sheep	09/01-12/15	1,005			1,005					
		Total		2,474		515	2,989	74	685	None	None	3,552
15. Poston	Season	Cattle	05/05-06/30	218		81	299	1,386 6/				
50,635	Long	Sheep	05/01-07/15	857		440	1,297					
	Grazing	Sheep	07/16-08/31	85	84		169					
		Sheep	09/01-12/15	1,440			1,440					
		Horses	04/16-12/31	119		16	135					
		Total		2,719	84	537	3,340	124	2,433	None	None	4,387
16. Pine Creek	Season	Cattle	07/01-10/31	629		103	732	628 6/				
14,089	Long	Sheep	07/11-09/16			26	26					
	Grazing	Horses	04/16-12/31	77	None	10	87					
		Total		706		139	845	15	760	None	None	985
TOTAL 1,957,604				77,177	1,977	10,233	89,382	60,179 6/ 5,906	93,095	3,448	9,600	131,898

1/ An AUM is the amount of forage 1 cow, 5 sheep, 14.6 pronghorn, 5 deer, 1.5 elk, 1 moose, or 1 horse would eat in 1 month.

2/ This includes the state and private land AUMs that would be available as exchange of use.

3/ Total allowance for wildlife and wild horses equals the sum of the noncompetitive, competitive, and special reservations (93,095 AUMs for wildlife and 9,600 AUMs for wild horses). The noncompetitive and competitive allowances are derived from the total allowance columns for wildlife and wild horses from TABLE 1-4 and the special allowances identified in Footnote 6 of this table. Competitive reservations are the portions of the livestock diets that overlap with those of wildlife and wild horse diets and which are needed to assure proper amounts of forage would be available for the numbers of wild animals expected in each allotment. Wild horse allowances represent enough forage for 800 animals for one year (800 x 12 = 9,600 AUMs), or the number of horses that are recommended for the area in the BLM's draft wild horse unit management plans. Wildlife allowances are based on the number of months each species would be expected in each allotment; numbers of animals are estimated from the population data provided by the Wyoming Game and Fish Department.

4/ Total forage use is the sum of the total livestock use and the total allowances for wildlife and wild horses.

5/ The 10,128 acres of the Buckskin-Sandy and Sandy (I-28) individual use pastures are not included in the Prospect Mountain Allotment for this alternative. See TABLE 8-99. Wildlife competitive AUMs and total allowable AUMs have also been adjusted.

6/ Wildlife habitat maintenance reservation: These AUMs represent livestock nonuse that would not.

TABLE 8-98

LOCATIONS AND SIZES OF PROPOSED RIPARIAN STUDY SITES

Allotment	Stream	Approximate Location	Approximate Stream (Miles)	Approximate Width in Feet (Area in Acres)
White Acorn	Blucher Creek	Station 9.5-10	0.5	600 ft. (36 ac.)
		Station 8.0-8.5	0.5	600 ft. (36 ac.)
	Tie Creek	Station 1.25-2.25	1.0	600 ft. (72 ac.)
BLUCHER/TIE CREEK HABITAT AREA TOTAL		3 sites	2.0	144 acres
White Acorn	Sweetwater River	Station 26-29	3.0	600 ft.. (216 ac.)
Gold Creek	Little Sweetwater	Station 1.0-2.0	1.0	600 ft. (72 ac.)
	Little Sweetwater Tributary A	Station 1.0-2.0	1.0	600 ft. (72 ac.)
SWEETWATER HABITAT AREA TOTAL		3 sites	5.0	360 acres
Gold Creek	East Fork Sweetwater	Station 1.0-1.5	0.5	600 ft. (36 ac.)
		Station 1.7-2.2	0.5	600 ft. (36 ac.)
		Station 2.5-3.0	0.5	600 ft. (36 ac.)
		Station 3.1-3.6	0.5	600 ft. (36 ac.)
		Station 4.0-4.5	0.5	600 ft. (36 ac.)
		Station 4.6-5.1	0.5	600 ft. (36 ac.)
		Station 5.2-6.2	1.0	600 ft. (72 ac.)
	Mill Creek	Station 1.0-2.0	1.0	600 ft. (72 ac.)
	Jack Creek	Station 1.0-1.5	0.5	600 ft. (72 ac.)
EAST FORK HABITAT AREA TOTAL		9 sites	5.5	432 acres
Gold Creek	Pine Creek	Station 10.0-11.5	1.5	600 ft. (108 ac.)
		Station 11.7-12.2	0.5	600 ft. (36 ac.)
PINE CREEK HABITAT AREA TOTAL		2 sites	2.0	144 acres
Prospect Mountain	Big Sandy River	Station 113-114	1.0	1,200 ft. (144 ac.)
		Station 110.5-111	0.5	600 ft. (36 ac.)
	Little Sandy River	Station 64-64.5	0.5	1,200 ft. (72 ac.)
		Station 65.5-66	0.5	1,200 ft. (72 ac.)
	Dutch Joe Creek	Station 2.1-2.6	0.5	600 ft. (36 ac.)
		Station 3.7-4.2	0.5	600 ft. (36 ac.)
SANDY UNIT TOTAL		6 sites	3.5	324 acres
Pacific Creek	Pacific Creek	Station 32-35	3	600-1200 ft. (288 ac.)
HABITAT AREA TOTAL		1 site	3	288 acres
Little Colorado	Big Sandy	Station 33-37	4.00	600 ft. (288 ac.)
	Bone Draw	Station 1.25-2.50	1.25	200 ft. (30 ac.)
LOWER SANDY HABITAT AREA TOTAL		2 sites	5.25	318 acres
TOTALS		26 sites	25.75	2010 acres

long term as identified in the proposed action (MAP 8-6). TABLE 1-13 shows the types of water developments proposed. Actual development would be predicated on big game habitat requirements (see APPENDIX 8A for antelope, mule deer, elk, and moose habitat requirements). These would be accomplished cooperatively (BLM and WGFD) and on a case-by-case basis.

Waters developed (existing and proposed) for livestock on big game summer habitat would be made available to wildlife in the spring-summer-fall periods, when livestock would not be occupying the range. Maintenance responsibilities of existing and proposed water developments would be as outlined in the Chapter 1 range improvements section. No fencing of existing water developments would occur in the short term. By the end of the long term up to 524 existing water developments would be fenced (see TABLE 2-8).

9. The four existing wells in pronghorn crucial winter habitat in the southeast portion of the Little Colorado Allotment (see MAP 3-1) would be shut off from April 1 to June 1 to discourage pronghorn summer use.

10. Burning or block-cutting would be conducted in the long term on 5,000 to 8,000 acres of aspen-conifer and aspen-sagebrush vegetation communities in the Bar X, Gold Creek, Little Prospect, Steamboat Mountain, Bush Rim, Continental Peak, Pacific Creek, White Acorn, Prospect Mountain, and Pine Creek Allotments (see MAP 8-6).

11. The following are long-term objectives for wildlife habitat requirements of those species shown:

A. Pronghorn Antelope

1. Provide a shrub composition of at least 30 to 40% and a forb composition of at least 30% on spring-summer-fall habitats.

2. Provide shrub composition of at least 20 to *30% Artemisia* and 10% other browse species on noncrucial winter habitat.

B. Mule Deer

1. Provide a forb composition of at least 20% on summer habitat.

2. Provide a shrub composition on winter habitat of 30 to 40% *Artemisia* and other browse species.

c. Sage Grouse

1. Provide shrub canopy of 20 to 40% on breeding complexes and winter habitat. This should be primarily *Artemisia* tridentata.

This alternative assumes that the latest information from WGFD and BLM surveys identified in this alternative would be used prior to its implementation. Allotment boundaries would be the same as they are at the present time (MAP 8-1). Individual use pastures would be the same as discussed in Alternative 1 and are shown in TABLE 8-99.

Four treatments would be used to make up the three different grazing systems for the Bar X, Gold Creek, and Fish Creek Allotments under this alternative (TABLE 8-97). The two- and three-pasture deferred systems are described in Chapter 1. The season-long grazing system is described in Alternative 1. Livestock use in unfenced allotments and range use supervision by Bureau employees would be the same as described in Alternative 1.

Although proposed range improvements would be limited to only those exclosures, riparian area fences, water developments and their fences identified on TABLE 8-100, additional projects of a similar nature may be constructed at some future time after consultation with WGFD.

ANALYSIS OF ALTERNATIVE 7 IMPACTS

Impacts of the existing environment's resources and land uses that would or could occur as a result of implementation of this alternative are analyzed in two stages: short term (eleven years following completion of this statement) and long term (23 years following completion of this statement). The analysis follows the same general pattern used to analyze the proposed action.

Soils

Sheet Erosion

Anticipated increases in ground cover from implementation of this alternative (see vegetation analysis) would decrease the estimated sheet erosion rate in the Sandy area by 444,754 tons per year to a total of approximately 7,933,856 tons per year in 23 years (TABLE 8-101).

Long-term reductions would vary within the proposed allotments depending upon the soil associations present. A detailed analysis of sheet erosion by soil association in each pasture is available for review upon request from the Rock Springs District Office.

The Musgrave Equation was used to compute the changes in sheet erosion rates. These calculations are dependent upon projected long-term increases in litter accumulation and canopy cover (TABLE 8-109) which were used to adjust the ground cover factor in the equation. APPENDIX 2B outlines how these calculations were made.

Mapping Units 132, 233, and 333 would continue to erode at high rates. Large areas (88,630 acres) of these soils are found in the Steamboat Mountain, Bush Rim, Continental Peak, and Pacific Creek Allotments. A pasture level analysis by soil association is available for review upon request from the Rock Springs District Office.

Substantial increases in total ground cover (varying from approximately 5 to 25%) would be anticipated on some allotments having mapping units with sagebrush-grass vegetation types (Bar X, Fish Creek, Gold Creek, Little Colorado, Sands, and Poston). These mapping units occur on about 78% (722,314 acres) of the allotments total area. This increase would result in decreased sheet erosion.

No decreases in total ground cover (see vegetation analysis) would be anticipated on any vegetation type in the Sandy area, with the exception of a small decrease in the grass type in the Little Colorado Allotment. In-

TABLE 8-99

PROPOSED USE OF NRL IN INDIVIDUAL USE PASTURES UNDER ALTERNATIVE 7

Area	Acres of NRL	AUMs From NRL	Class of Stock	Season of Use
I-1	170	6	Cattle	03/01 to 02/28
I-2	77	5	Cattle	05/01 to 12/15
I-3	144	16	Cattle	05/01 to 12/15
I-4	54	11	Cattle	05/01 to 12/15
I-5	297	20	Sheep	05/01 to 10/31
I-6	503	61	Horses	05/01 to 12/15
I-7	265	29	Horses	05/01 to 12/15
I-8	13	1	Cattle & Sheep	05/01 to 12/15
I-9	96	8	Cattle	06/01 to 10/31
I-10	71	6	Cattle	06/01 to 10/31
I-11	178	11	Cattle	05/15 to 09/15
I-12	66	9	Cattle & Sheep	05/03 to 10/31
I-13	13	5	Cattle & Sheep	05/03 to 10/31
I-14	16	2	Sheep	05/01 to 10/31
I-15	2,209	286	Sheep	05/01 to 10/31
I-16	96	23	Sheep	05/01 to 10/31
I-17	197	14	Cattle	10/01 to 10/31
I-18	120	11	Cattle	05/01 to 10/31
I-19	191	17	Horses	05/05 to 09/30
I-20	3	1	Cattle	05/01 to 10/31
I-21	1,094	125	Cattle	08/15 to 09/15
I-22	19	4	Cattle	07/01 to 10/31
I-23	92	6	Cattle	07/01 to 10/31
I-24	1,197	83	Cattle & Sheep	05/05 to 12/31
I-25 Long Draw Pasture	2,153	270	Cattle	07/01 to 09/30
I-26 Grass Creek Pasture	1,677	208	Cattle	07/01 to 10/31
I-27	98	5	Cattle	05/01 to 09/30
I-28 Sandy Pasture	1,389	180	Cattle	05/01 to 12/31
I-29	13	1	Cattle	05/01 to 10/31
I-30 Buckskin Pasture	1,083	41	Cattle	07/01 to 09/30
I-31	537	75	Cattle	05/01 to 01/30
I-32	85	6	Cattle	05/01 to 01/31
I-33	8	1	Cattle	10/01 to 10/31
Buckskin-Sandy Pasture	7,365	742	Cattle	06/16 to 10/31
TOTAL	21,589*	2,289		

* This represents only the national resource lands in the individual use pastures. The pastures total 39,726 acres.

TABLE 8-100

PROPOSED WATER DEVELOPMENTS BY ALLOTMENT UNDER ALTERNATIVE 7

Allotment	Reservoirs	Pits
Poston	5	3
Little Colorado		
Prospect Mountain	5	1
Little Sandy	9	5
Little Prospect	9	5
White Acorn	7	
Bar X	3	1
Fish Creek		1
Pine Creek	1	
Continental Peak	2	
Steamboat Mountain	2	1
Sands		7
Reservoir	2	1
Buckskin-Sandy	1	
TOTALS	47	25

TABLE 8-101

LONG-TERM SHEET EROSION UNDER ALTERNATIVE 7

Allotment	Pasture	Acres	Geologic Erosion Tons/Year	Sheet Erosion Tons/Year	Total Erosion Tons/Year
Bar X					
	1	2,124	1,950	1,273	3,223
	2	2,543	2,335	740	3,075
	3	2,228	2,045	396	2,441
Total		6,895	6,330	2,409	8,739
Fish Creek					
	1	3,389	3,111	2,467	5,578
	2	3,848	3,532	3,048	6,580
Total		7,237	6,643	5,515	12,158
Gold Creek					
	1	4,662	4,280	3,505	7,785
	2	10,591	9,723	9,235	18,958
	3	9,327	8,562	6,806	15,368
Total		24,580	22,565	19,546	42,111
Willow Creek		5,945	5,458	9,293	14,751
Little Sandy		114,879	105,459	315,047	420,506
Little Prospect		70,781	64,977	160,476	225,453
Steamboat Mountain		38,276	35,137	625,880	661,017
Little Colorado		726,956	667,346	1,404,479	2,071,825
Red Desert		252,229	231,546	467,829	699,375
Bush Rim		100,437	92,201	756,188	848,389
Continental Peak		89,914	82,541	569,231	651,772
Pacific Creek		203,738	187,031	895,825	1,082,856
Sands		112,051	102,863	402,051	504,914
White Acorn		46,794	42,957	134,619	177,576
Prospect Mountain		56,623	51,980	146,632	198,612
Reservoir		35,545	32,630	72,108	104,738
Poston		50,635	46,483	130,873	177,356
Pine Creek		14,089	12,934	18,774	31,708
TOTALS		1,957,604	1,797,081	6,136,775	7,933,856

creases in total ground cover are expected in meadow types, however, due to their small extent and nearly level slopes resulting decreases in sheet erosion would be small.

In the Little Sandy, Little Prospect, Steamboat Mountain, Red Desert, Bush Rim, Continental Peak, Pacific Creek, White Acorn, Prospect Mountain, Reservoir, and Pine Creek Allotments no measurable increase or decrease would be anticipated in sheet erosion. Exact amounts of increase or decrease for various mapping units are available for review at the Rock Springs District Office.

Sheet erosion and runoff are not expected to increase as a result of prescribed burning or block-cutting of the 5,000 to 8,000 acres of aspen-conifer or aspen-sagebrush communities since the areas proposed are small in size and widely distributed over the Sandy area (MAP 8-6).

The guidelines for acceptable average erosion per pasture (Soil Conservation Service 1973) were used to determine the acres by class under this alternative. It was found that 432,365 acres would be in the excessive erosion category of more than 5 tons per acre per year the same as Alternative 1 (TABLE 8-102). This represents an increase of 12,731 acres in this category over the existing conditions (TABLE 2-4). The moderate average erosion per pasture would occur on 1,486,527 acres, an increase of 68,762 acres. The increase in acres under excessive and moderate sheet erosion would be reflected in a decrease in the light category from 91,621 to 38,712 acres (TABLE 8-102).

Wind Erosion

Wind erosion rates respond inversely to the ground cover (Humphrey 1962). Since the ground cover would generally be expected to increase area-wide (vegetation analysis) the amount of wind erosion would be expected to decrease. The amount is not quantifiable at this time because studies are not available.

Compaction

Determined by using a technique similar to that used to estimate the relative degree of current use by livestock (APPENDIX 2D), TABLE 8-103 portrays the expected relative degree of use for the short and long terms.

Decreased acres in the moderate, heavy and severe grazing intensity categories in the short term reflect the decrease in the AUMs used and an increase in water available in areas outside wildlife critical habitat. The decrease in areas in the marginal and slight categories reflects the increased areas available to grazing use as a result of increased water developments. The result is an overall increase in the light grazing category of 92,553 (TABLES 2-6 and TABLE 8-103).

Additional water developments would be allowed in the long term in the wildlife critical habitat areas. This would result in a further increase in acres available to livestock, wild horses, and wildlife, and in better livestock distribution throughout the Sandy area. This would then reflect a further shift of acres out the light, moderate, heavy, and severe erosion catagories and into the marginal to slight erosion categories. The result would be an overall increase in acres (long term compared to short term) in the marginal to slight erosion categories of 55,137 acres resulting in less sheet erosion.

Water Resources

Water Use

Water consumption by livestock under this alternative would be 85 acre-feet per year at the end of the eleven and twenty-three year periods (TABLE 8-104). This would be an increase of 6 acre-feet in the short and long term above existing water use levels (TABLE 2-7).

Evaporation losses in the short term would increase 188 acre-feet (21%) over existing levels in the Sandy area. Long term evaporation losses would increase by 313 acre-feet (36%). Total evaporation losses by reservoirs and pits would be 1,189 acre-feet in 23 years (TABLES 2-9 and 8-105).

Streamflow

Changes in runoff from Alternative 7 would have no measurable effect on annual perennial streamflow (see Chapter 3 discussion). However, storm runoff from a ten-year event would increase 3% above existing levels in the Sandy area at the end of 11 years and 5% at the end of 23 years (TABLE 8-106). Burning or block-cutting on 5,000 to 8,000 acres of aspen-conifer and aspen-sage vegetation communities in the Bar X, Gold Creek, Little Prospect, Steamboat Mountain, Continental Peak, White Acorn, and Prospect Mountain Allotments would increase storm runoff due to locally decreased cover density. However, the increases in storm runoff would be insignificant.

Water Quality

This alternative would have no measurable effect on water quality in perennial streams within the Sandy area or downstream. As perennial streamflow would not be expected to change, sediment transport would remain unchanged in perennial streams (see Chapter 3 streamflow discussion).

Sediment yield in the intermittent streams in the Sandy area increases proportionally to the increase in storm runoff. However, sediment transport would decrease on the Bar X, Fish Creek, Gold Creek, and Steamboat Mountain Allotments in 23 years due to a decrease in runoff in these allotments (TABLE 8-106). The Pacific Southwest Interagency Committee (PSIAC) method for estimating sediment yield (APPENDIX 2F) was applied to Alternative 7, and these calculations indicate there would be a 7% increase in sediment yield over existing levels. This would not significantly change water quality

TABLE 8-102

ACREAGES OF AVERAGE EROSION BY CLASS UNDER ALTERNATIVE 7

Allotment	Light*	Moderate*	Excessive*
Bar X	6,895		
Fish Creek	7,237		
Gold Creek	24,580		
Willow Creek		5,945	
Little Sandy		114,879	
Little Prospect		70,781	
Steamboat Mountain			38,276
Little Colorado		726,956	
Red Desert		252,229	
Bush Rim			100,437
Continental Peak			89,914
Pacific Creek			203,738
Sands		112,051	
White Acorn		46,794	
Prospect Mountain		56,623	
Reservoir		35,545	
Poston		50,635	
Pine Creek		14,089	
TOTAL	38,712	1,486,527	432,365

*Light - less than 2 tons per acre per year; Moderate - 2 to 5 tons per acre per year; Excessive - greater than 5 tons per acre per year.

TABLE 8-103

PROJECTED SHORT-TERM AND LONG-TERM ACRES OR GRAZING INTENSITY UNDER ALTERNATIVE 7

	Short-Term Mean					Long-Term Mean				
Allotment	Marginal* to Slight*	Light*	Moderate*	Heavy*	Severe*	Marginal* to Slight*	Light*	Moderate*	Heavy*	Severe*
Bar X	415	3,949	1,687	546	298	415	3,949	1,687	546	298
Fish Creek	0	4,773	1,815	466	183	0	4,773	1,815	466	183
Gold Creek	0	19,293	3,933	980	374	0	19,293	3,933	980	374
Willow Creek	0	4,574	1,005	261	105	0	4,574	1,005	261	105
Little Sandy	17,243	81,689	11,441	3,145	1,361	16,039	82,963	11,391	3,131	1,355
Little Prospect	19,669	39,391	8,242	2,364	1,085	15,219	44,011	8,143	2,336	1,072
Steamboat Mountain	25,423	10,791	1,480	406	176	25,764	10,505	1,441	396	170
Little Colorado	393,867	279,511	38,426	10,572	4,580	395,254	278,348	38,266	10,528	4,560
Red Desert	218,588	28,587	3,691	969	394	218,588	28,587	3,691	969	394
Bush Rim	90,536	8,417	1,084	284	116	90,536	8,417	1,084	284	116
Continental Peak	52,585	31,854	4,022	1,039	414	52,585	31,854	4,022	1,039	414
Pacific Creek	95,803	93,107	11,068	7,735	1,025	144,597	51,016	6,064	1,499	562
Sands	83,385	24,894	2,844	682	246	85,095	23,409	2,674	642	231
White Acorn	17,513	25,061	3,114	795	311	17,513	25,061	3,114	795	311
Prospect Mountain	3,547	45,425	5,645	1,442	564	12,136	36,697	5,921	1,390	479
Reservoir	8,436	22,778	3,112	852	367	8,436	22,778	3,112	852	367
Poston	9,349	32,899	5,990	1,665	732	9,349	32,899	5,990	1,665	732
Pine Creek	3,170	8,568	1,798	391	162	3,170	8,568	1,798	391	162
TOTAL	1,039,559	765,561	110,397	29,594	12,493	1,094,696	717,702	105,151	28,170	11,885

*Marginal Those acres generally too distant from water to be grazed.
Slight - Those acres within reach of water, but grazed at an intensity greater than 75 acres/AUM.
Light - Grazing intensity from 16 to 75 acres/AUMs.
Moderate - Grazing intensity from 5.5 to 16 acres/AUM.
Heavy - Grazing intensity from 2 to 5.5 acres/AUM.
Severe - Grazing intensity less than 2 acres/AUM.

TABLE 8-104

WATER USE BY LIVESTOCK, INCLUDING EXCHANGE OF USE, UNDER ALTERNATIVE 7

Allotment	Short Term in Acre-Feet*
Bar X	0.87
Fish Creek	0.75
Gold Creek	2.81
Willow Creek	0.71
Little Sandy	8.43
Little Prospect	5.15
Steamboat Mountain	1.32
Little Colorado	28.68
Red Desert	4.38
Bush Rim	1.53
Continental Peak	3.75
Pacific Creek	6.74
Sands	2.85
White Acorn	3.42
Prospect Mountain	4.32
Reservoir	2.48
Poston	4.08
Pine Creek	0.78
Allotment Total	83.05
Individual Use Pastures**	2.11
TOTAL	85.16 1/

* Based on use of 300 gallons per AUM

** From national resource land AUMs (TABLE 8-97).

1/ Long term use would be the same as short term.

TABLE 8-105

EVAPORATION LOSSES IN ACRE-FEET BY THE PROPOSED RESERVOIRS AND PITS UNDER ALTERNATIVE 7

Allotment	Number of Proposed Developments in Short Term		Evaporation losses in Acre-Feet		TOTAL Short-Term Losses	Number of Proposed Developments in Long Term		Evaporation losses in Acre-Feet		TOTAL Long-Term Losses
	Pits	Reservoirs	Pits	Reservoirs		Pits	Reservoirs	Pits	Reservoirs	
Bar X	1	3	1.49	17.58	19.07	1	3	1.49	17.58	19.07
Fish Creek	1	0	1.49	0	1.49	1	0	1.49	0	1.49
Little Sandy	2	3	2.98	17.58	20.56	5	9	7.45	52.74	60.19
Little Prospect	3	4	4.47	23.44	27.91	5	9	7.45	52.74	60.19
Steamboat Mt.	1	1	1.49	5.86	7.35	1	2	1.49	11.72	13.21
Continental Peak	0	2	0	11.72	11.72	0	2	0	11.72	11.72
Sands	4	0	5.96	0	5.96	7	1	10.43	5.86	16.29
White Acorn	0	6	0	35.16	35.16	0	7	0	41.02	41.02
Prospect Mountain	0	0	0	0	0	1	5	1.49	29.30	30.79
Buckskin Sandy	0	1	0	5.86	5.86	0	1	0	5.86	5.86
Reservoir	1	2	1.49	11.72	13.21	1	2	1.49	11.72	13.21
Poston	3	5	4.47	29.30	33.77	3	5	4.47	29.30	33.77
Pine Creek	0	1	0	5.86	5.86	0	1	0	5.86	5.86
TOTALS	16	28	23.84	164.08	187.92	25	47	37.25	275.42	312.67

Reservoir Evaporation Rate = 5.86 acre-feet/year
Pit Evaporation Rate = 1.49 acre-feet/year (APPENDIX 2E)

TABLE 8-106

MODEL STORM RUNOFF IN ACRE-FEET BY ALLOTMENT
UNDER ALTERNATIVE 7
(10-YEAR STORM)

Allotment	Existing	Short Term	Long Term
1. Bar X	1.5	1.5	0.5
2. Fish Creek	0.9	0.8	0.3
3. Gold Creek	19.8	20.2	17.1
3a. Willow Creek	2.8	2.9	2.9
4. Little Sandy	64.3	65.7	65.6
4a. Little Prospect	13.9	14.0	14.0
5. Steamboat Mountain	120.8	30.2	30.2
6. Little Colorado	14.7	15.1	17.2
7. Red Desert	17.1	17.4	17.4
8. Bush Rim	66.9	68.1	68.1
9. Continental Peak	82.9	84.1	84.0
10. Pacific Creek	58.2	62.3	62.3
11. Sands	2.0	35.5	35.5
12. White Acorn	12.8	12.9	12.9
13. Prospect Mountain	11.4	11.9	11.9
14. Reservoir	22.1	22.6	22.6
15. Poston	15.5	16.1	16.1
16. Pine Creek	2.2	2.2	2.2
Weighted Mean	29.5	30.4	31.1
Percent Change		+3%	+5%

in perennial streams since streamflow would not be expected to change; subsequently, sediment transportation would be unchanged. Burning or block-cutting on 5,000 to 8,000 acres of aspen-conifer and aspen-sage vegetation communities would increase sediment yield locally due to increases in storm runoff. However, the increases in sediment yield would be slight and cannot be quantified.

Channel stability would decrease slightly in the Sandy area due to increased grazing intensity along streams (TABLE 8-107). Channel stability would increase, decreasing bank erosion in the Continental Peak and White Acorn Allotments (TABLE 8-107). This is due to a decrease in livestock grazing intensity along streams during the grazing period (TABLE 8-108). The channel stability in the other allotments would remain at about the same level. The concentration of dissolved solids would increase during runoff events in the intermittent streams within the Sandy area because of an increase in upland sediments from intermittent streams. Salinity levels would decrease on the Bar X, Gold Creek, Prospect Mountain, and Reservoir Allotments due to a projected decrease in sediment yield and runoff.

Fecal coliforms (indicators of bacteriological contamination) from livestock grazing on NRL would increase above existing levels because of increased grazing intensity (TABLE 8-108). Fecal coliforms from livestock grazing on NRL would decrease on the Sands and Reservoir Allotments due to a decrease in grazing intensity (TABLE 8-108).

Vegetation

This alternative involves two- and three-pasture deferred grazing systems on the Bar X, Fish Creek, and Gold Creek Allotments totaling 38,712 acres, the same as Alternative 1 (TABLE 8-2). Season-long grazing would occur on the remaining fifteen allotments, containing a total of 1,918,892 acres. On all allotments, livestock use would be maintained at the present actual use level of 89,382 AUMs (TABLE 8-97). This is a 41% reduction from the total Federal, State, and private actual use (86,105 AUMs) and total nonuse (64,183 AUMs) qualifications which equal 150,288 AUMs (TABLE 2-70). Wildlife numbers would be maintained at the WGFD objective levels (TABLE 2-37). Vegetative response would vary by allotment. On allotments where substantial nonuse exists now (TABLE 2-70), vegetative response would tend to be the most dramatic.

Vegetation Types

The overall type acreages for the Sandy area as shown in TABLES 2-13 and 2-14 would not be expected to change under this alternative. Plant composition within each type that is grazed continuously throughout the growing season would be expected, however, to change slightly to more of a shrub-forb complex where cattle grazing would be continued at intensive levels in the Little Sandy, Little Prospect, Little Colorado, and Prospect Mountain Allotments. Hormay (1970) states that a major cause of range deterioration is selective, close grazing of plants and range areas in similar yearly patterns of use. Where sheep use, especially winter use, is eliminated or significantly reduced shrubs and forbs will also be favored over grasses. Sheep use would be reduced significantly in the Steamboat Mountain, Little Colorado, Red Desert, Bush Rim, Continental Peak, Pacific Creek, Sands, White Acorn, Poston, and Pine Creek Allotments.

Cover. Cover changes would be minor (TABLE 8-109). No detectable changes in vegetal cover are expected. Ground cover would increase due to increased litter accumulation and increased vigor on allotments where use is reduced.

Forage Production. Total forage production would increase for all species in the area. Most allotments would increase for all species with the following exceptions: Cattle—Little Sandy, Little Prospect, White Acorn, and Reservoir would remain unchanged, and Little Colorado would decline slightly; and sheep—Little Sandy, Little Prospect, and Little Colorado would remain unchanged, and Reservoir would decline slightly. TABLE 8-110 shows the projected long-term forage production and use under Alternative 7.

Range Condition and Trend. TABLE 2-31 shows the present apparent range trend in The Sandy area. This alternative would have the following effects: Cattle—trend for cattle would remain essentially unchanged. Sheep—most static acres would show a definite upward trend on the Steamboat Mountain, Little Colorado, Red Desert, Bush Rim, Continental Peak, Pacific Creek, Sands, White Acorn, Poston, and Pine Creek Allotments. The acres currently in a downward trend on the Little Colorado, Pacific Creek, and Sands Allotments should stop this trend and remain static. Trend changes for antelope and deer would parallel those shown for sheep. Trend for elk and moose should remain essentially unchanged. This would result in an overall improvement in range condition for the Sandy area.

Deferred Grazing Systems. The grazing systems proposed for the Bar X, Fish Creek, and Gold Creek Allotments would afford a deferment from grazing until seedripe in the two-pasture system of Fish Creek and the three-pasture system of Gold Creek and until flowering and seedripe dates in the three-pasture system of Bar X. This would allow the plants to maintain their vigor and produce seed. Plant composition would not be expected to change as adequate rest would be provided to maintain the present situation, but no rest is allowed for seedling establishment. Ground cover should improve as reflected in TABLE 8-108. This would be the result of increased vigor on plants and reduced utilization, leaving increased amounts of litter at the end of the grazing season. Johnson (1965) found that deferred grazing resulted in reduced utilization without reducing the number of animals grazed.

Forage production would increase over the long term on those three allotments under deferred grazing systems. The predicted increase would mostly be a result of the increased vigor in the meadow type, which is currently taking the bulk of the grazing load.

TABLE 8- 107

PROJECTED CHANNEL STABILITY RATING

UNDER ALTERNATIVE 7*

Allotment	Stream Miles	Present	Potential	23 Years Future
Bar X	9.00	99	79	99
Fish Creek	5.50	92	84	92
Gold Creek	29.75	96	90	96
Willow Creek	9.25	98	93	98
Little Sandy	35.00	110	90	115
Little Prospect	7.25	95	77	108
Steamboat Mountain	9.50	110	89	116
Little Colorado	60.25	94	86	97
Continental Peak	6.25	99	79	98
Pacific Creek	48.00	107	92	107
White Acorn	22.75	96	81	94
Prospect Mountain	24.75	103	98	103
Reservoir	14.50	111	111	111
Poston	3.00	104	104	104
Pine Creek	10.50	97	92	97
TOTAL MILES	295.25			
MEAN		100	90	102
Percent Change			-10%	+2%

*Channel Stability Rating	Condition
38 or less	Excellent
39-76	Good
77-95	High-Fair
96-114	Low-Fair
115 or more	Poor

TABLE 8-108

RELATIVE GRAZING INTENSITY 100 YARDS FROM WATER UNDER ALTERNATIVE 7

Allotment	Existing	Short Term
Bar X	92	92
Fish Creek	65	65
Gold Creek	44	44
Little Sandy	59	68
Little Prospect	59	81
Steamboat Mountain	7	56
Little Colorado	60	66
Red Desert	3	30
Bush Rim	1	6
Continental Peak	35	29
Pacific Creek	10	10
Sands	15	5
White Acorn	45	33
Prospect Mountain	42	42
Buckskin-Sandy	75	95
Reservoir	67	63
Poston	49	49
Pine Creek	35	35
MEAN	38	36
% Change		- 5%

TABLE 8-109

LONG-TERM AVERAGE PERCENT GROUND COVER AND VEGETAL COVER UNDER ALTERNATIVE 7

	Vegetation Types							
	Sagebrush-Grass		Saltbush-Winterfat		Grass		Meadow	
Allotments	Percent Ground Cover	Percent Vegetal Cover	Percent Ground Cover	Percent Vegetal Cover	Percent Ground Cover	Percent Vegetal Cover	Percent Ground Cover	Percent Vegetal Cover
Bar X	60	17					94	30
Fish Creek	46	15					91	26
Gold Creek	40	17					73	25
Little Sandy-Little Prospect	39	15					86	30
Steamboat Mountain	49	11					65	22
Little Colorado	26	17	23	15	26	23	34	32
Red Desert	27	14	27	9	18	15		
Bush Rim	28	13	42	11	18	15	97	18
Continental Peak	47	16	16	7	18	14	97	19
Pacific Creek	40	14	68	6	47	12	85	17
Sands	30	15			32	16	68	23
White Acorn	54	16					80	29
Prospect Mountain	36	15					56	30
Reservoir	32	12					49	28
Poston	29	13					55	30
Pine Creek	56	15					65	26

Allotments	Greasewood		Mountain Shrub		Perennial Forbs		Conifer	
Bar X								
Fish Creek								
Gold Creek			87	18			78	9
Little Sandy-Little Prospect			77	12				
Steamboat Mountain	56	12	79	18	16	6		
Little Colorado	28	11					27	12
Red Desert	22	6			16	9		
Bush Rim	14	16	64	19	16	12	78	9
Continental Peak	74	11	94	19	22	14		
Pacific Creek	22	21	94	16	11	12	76	11
Sands	14	12			11	12	74	8
White Acorn			53	14			78	11
Prospect Mountain			77	16			93	3
Reservoir								
Poston								
Pine Creek								

TABLE 8-110

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 7 BY ANIMAL CLASS
IN POUNDS OF DRY WEIGHT FORAGE AND AUMS

	Cattle and Domestic Horses		Sheep		Wild Horses	
Allotment	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
1. Bar X	847,080 (1,086)	686,400 (880)	933,750 (1,245)	57,000 (70)		
2. Fish Creek	818,220 (1,049)	634,920 (814)	849,000 (1,132)			
3. Gold Creek	2,825,160 (3,622)	2,382,900 (3,055)	2,579,250 (3,439)			
3a. Willow Creek	614,640 (788)	574,860 (737)	563,250 (750)			
4. Little Sandy	6,786,000 (8,700)	6,685,380 (8,571)	7,810,500 (10,414)	383,250 (511)		
4a. Little Prospect	4,555,980 (5,841)	1,921,920 (2,464)	5,206,500 (6,942)	2,346,000 (3,128)		
5. Steamboat Mountain	1,638,000 (2,100)	624,780 (801)	1,950,000 (2,600)	478,500 (638)	1,620,000 (1,800)	
6. Little Colorado	29,835,780 (38,251)	6,867,120 (8,804)	37,275,000 (49,700)	16,660,500 (22,214)	34,425,900 (38,251)	1,620,000 (1,800)
7. Red Desert	15,323,880 (19,646)		17,439,000 (23,252)	3,558,000 (4,744)	17,681,400 (19,646)	4,749,300 (5,277)
8. Bush Rim	5,534,100 (7,095)		7,293,750 (9,725)	1,248,000 (1,664)	6,385,500 (7,095)	1,206,000 (1,340)
9. Continental Peak	5,343,000 (6,850)		6,450,000 (8,600)	3,055,500 (4,074)	5,670,000 (6,300)	1,064,700 (1,183)
10. Pacific Creek	10,616,580 (13,611)	537,420 (689)	13,050,000 (17,400)	4,974,750 (6,633)		
11. Sands	4,290,000 (5,500)	1,941,420 (2,489)	5,264,250 (7,019)	451,500 (602)		
12. White Acorn	4,195,620 (5,379)	1,141,920 (1,464)	4,200,000 (5,600)	1,684,500 (2,246)		
13. Prospect Mountain	4,188,600 (5,370)	2,163,720 (2,774)	4,515,750 (6,021)	1,436,250 (1,915)		
14. Reservoir	1,274,520 (1,634)		1,683,750 (2,245)	1,631,250 (2,175)		
15. Poston	3,375,060 (4,327)	338,520 (434)	4,392,750 (5,857)	2,179,500 (2,906)		
16. Pine Creek	943,020 (1,209)	638,820 (819)	2,142,750 (2,857)	19,500 (26)		
TOTALS	103,005,240 (132,058)	27,140,100 (34,795)	117,149,250 (164,798)	40,164,000 (53,546)	65,782,800 (73,092)	8,640,000 (9,600)

TABLE 8-110 (Continued)

PREDICTED LONG-TERM PRODUCTION AND USE UNDER ALTERNATIVE 7 BY ANIMAL CLASS
IN POUNDS OF DRY WEIGHT FORAGE AND AUMS

	Antelope		Deer		Elk		Moose	
Allotment	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)	Production Pounds Dry Weight Forage (AUMs)	Available Use Pounds Dry Weight Forage (AUMs)
1. Bar X	561,782 (697)	29,822 (37)	626,430 (1,330)	75,360 (160)				
2. Fish Creek	807,612 (1,002)	36,270 (45)	1,047,504 (2,224)	75,360 (160)			359,100 (665)	19,440 (36)
3. Gold Creek	1,848,964 (2,294)	120,900 (150)	2,177,904 (4,624)	399,879 (849)	2,266,380 (4,197)	317,520 (588)	631,260 (1,169)	37,800 (70)
3a. Willow Creek	405,418 (503)	33,046 (41)	472,884 (1,004)	95,142 (202)	527,580 (977)	129,600 (240)	136,620 (253)	14,040 (26)
4. Little Sandy	9,040,902 (11,217)	490,854 (609)	9,215,115 (19,565)	1,988,091 (4,221)	1,976,940 (3,661)	967,140 (1,791)	779,220 (1,443)	122,580 (227)
4a. Little Prospect	6,027,268 (7,478)	301,444 (374)	6,143,724 (13,044)	1,211,883 (2,573)	1,317,600 (2,440)	1,007,100 (1,865)	519,480 (962)	104,220 (193)
5. Steamboat Mountain	2,176,200 (2,700)	124,124 (154)	1,836,900 (3,900)	72,534 (154)	1,944,000 (3,600)	77,760 (144)		
6. Little Colorado	48,037,600 (59,600)	2,414,776 (2,996)	8,525,100 (18,100)	168,618 (358)	1,242,000 (2,300)			
7. Red Desert	14,628,094 (18,149)	519,870 (645)	631,611 (1,341)	424,842 (902)	1,723,680 (3,192)	99,360 (184)		
8. Bush Rim	6,655,142 (8,257)	336,102 (417)	4,035,528 (8,568)	176,154 (374)	5,637,600 (10,440)	172,800 (320)		
9. Continental Peak	6,286,800 (7,800)	270,010 (335)	5,133,900 (10,900)	538,353 (1,143)	324,000 (600)	108,000 (200)	27,000 (50)	
10. Pacific Creek	12,573,600 (15,600)	761,670 (945)	12,246,000 (26,000)	313,215 (665)	7,344,000 (13,600)	457,920 (848)	187,380 (347)	53,460 (99)
11. Sands	7,804,498 (9,683)	310,310 (385)	8,835,960 (18,760)	188,871 (401)	5,663,520 (10,488)	228,960 (424)		
12. White Acorn	3,067,636 (3,800)	188,604 (234)	3,297,000 (7,000)	756,426 (1,606)	1,695,060 (3,139)	466,560 (864)	966,060 (1,789)	51,840 (96)
13. Prospect Mountain	4,569,214 (5,669)	268,398 (333)	4,752,390 (10,090)	755,955 (1,605)	1,015,740 (1,881)	535,680 (992)	234,360 (434)	58,320 (108)
14. Reservoir	1,810,276 (2,246)	146,692 (182)	1,823,712 (3,872)	349,482 (742)			54,000 (100)	25,920 (48)
15. Poston	6,493,942 (8,057)	146,692 (182)	5,599,248 (11,888)	29,202 (62)			59,400 (110)	19,440 (36)
16. Pine Creek	925,288 (1,148)	42,718 (53)	1,076,706 (2,286)	113,511 (241)	262,440 (486)		320,220 (593)	19,440 (36)
TOTALS	133,720,236 (165,900)	6,542,302 (8,117)	77,477,616 (164,496)	7,732,878 (16,418)	32,940,540 (61,001)	4,568,400 (8,460)	4,274,100 (7,915)	526,500 (939)

Range trend and condition should improve on the three allotments with deferred grazing. This would be a result of the improved vigor on the desirable species.

Prescribed Burning. Prescribed burning or block-cutting of aspen would result in changes to the stand character of up to 8,000 acres of aspen-conifer and aspen-sagebrush vegetation subtypes in the Gold Creek, Little Prospect, Steamboat Mountain, Bush Rim, Continental Peak, Pacific Creek, White Acorn, Prospect Mountain, and Pine Creek Allotments. The objective of this practice is to remove decadent and diseased aspen, to increase aspen reproduction, to open existing even-aged stands, to provide for a wider variety both in aspen age and understory composition, to create additional edge effects, and to preserve other resource values in the selected areas. Block-cutting would be the selected alternative where soil, slope, climatic, or other characteristics render burning uncontrollable. Vegetation impacts would be insignificant when considered within the area or any allotment as a whole. Locally, treated stands would be measurably and visibly impacted. Selected stands would have the mature canopy essentially removed from the treated blocks. Within the treated blocks, shade tolerant species (e.g., umbellifers) would be eliminated in favor of more light tolerant species. Aspen regeneration would also be stimulated. No treated blocks are expected to convert to another vegetation type. Mature, decadent, diseased stands would be replaced by younger, seral stands with characteristically transitional understories. Forage production and availability for all species of wildlife would increase within the treated blocks. Forage quality and diversity would be high. Wildlife and possibly livestock use would increase within the treated blocks. This would result in decreased use of wildlife in other adjacent areas since numbers are to be held at objective levels.

Threatened or Endangered Plants

As discussed in Chapter 2, *Lesquerella macrocarpa and Antennaria arcuata* may occur within the Sandy area. Their response to the proposed grazing treatments for this alternative should be similar to other species of similar growth characteristics. Their existence should continue if they are present in the Sandy area.

Wildlife

Terrestrial

Impacts from this alternative would affect the populations of the four big game species in the Sandy area (pronghorn antelope, mule deer, elk, and moose) as well as sage grouse, waterfowl, and numerous nongame species. The primary factors relative to the impacts on wildlife populations are food, water, cover, migration habits, space and the conditions and availability of each factor.

Pronghorn Antelope. Alternative 7 would result in an increased antelope population in both the short and long terms above the desired population level; however, harvest strategies would be implemented to maintain populations at current levels which reflect the desired management level (TABLE 2-37).

Food. As was stated in Chapter 2, the sagebrush-grass vegetation type is the most common to antelope habitat, and sagebrush is the forage species most heavily used by antelope on a yearlong basis (Taylor 1975).

Increased quantity and quality (i.e., plant vigor) of winter shrub forage is anticipated due to a decrease in season-long livestock use and summer-fall antelope use on winter habitat in the summer and fall. The promotion of better pronghorn distribution on summer habitat (i.e., through water development) would increase pronghorn utilization of summer habitat forage. Competition for spring-summer forbs is expected to remain the same as the current situation. Sheep competition on crucial winter habitat would be decreased by their exclusion during the winter.

Forage production on the total Sandy area for pronghorn would be expected to remain approximately the same as for the present situation over the long term (TABLES 2-27 and 8-111). Since it is assumed activation of livestock nonuse would not be allowed, competition for forage and space between antelope and livestock would be the same as at present. With the maintenance of vegetal composition objectives for seasonal pronghorn habitat, no marked change is anticipated from the current situation.

Cover. Based on the analysis of food adequacy for pronghorn on the Sandy area and projected size of the sagebrush-grass vegetation type, cover should be increased because of increased plant vigor and resultant canopy height increases. Greater access to more areas would be brought about by availability of additional water developments.

Water. Water availability to antelope on crucial winter habitat would decrease during the summer as wells would be closed to antelope use. This would promote a shift of antelope from their winter habitat to summer habitat allowing for increased forage availability during the winter. Increased water availability on antelope summer habitat would also promote better distribution of use. Competition for available water is expected to remain similar to the present situation.

Migration and Space. Antelope access to new forage, distribution, and seclusion opportunities are expected to increase in the long term as a result of summer habitat water developments, especially in the Little Colorado and Red Desert Allotments where limited waters now exist. Improved spring-summer-fall distribution of antelope would decrease the frequency of pronghorn/livestock and pronghorn/other wildlife interactions. This coupled with other factors (i.e., increased summer water availability, sustained yearlong forage quality, and decreased predation effects), could result over the long term in increased fawn survival and in an increased annual sustained yield of harvestable antelope.

The problems with the sheep-tight highway fences as discussed in Chapter 2 would continue; however, fencing modifications and design on other fences (MAP 8-6) coupled with the low-scale fencing in this alternative

TABLE 8-111

PREDICTED LONG-TERM FORAGE PRODUCTION FOR MAJOR ANIMAL SPECIES IN THE SANDY AREA WITH IMPLEMENTATION OF ALTERNATIVE 7

Species	AUMs*	Animal Months Provided*	Pounds of Dry Weight Forage
Cattle	132,058	132,058	103,005,240
Sheep	164,798	823,945	117,149,250
Wild Horses	73,092	9,600	65,782,800
Pronghorn Antelope	165,900	2,344,167	133,720,236
Mule Deer	164,496	822,480	77,477,616
Elk	61,101	132,589	32,940,540
Moose	7,915	7,915	4,274,100

* These figures represent the amount of production for each species in those areas which are considered suitable habitat or where management is proposed as is the case for wild horses.

(limited to riparian study and management areas) would cause minimum conflicts with antelope movements and distribution. Fence modifications made in the White Acorn and Prospect Mountain Allotments and in the Pinedale Resource Area-Sandy area boundary fence would better accommodate antelope movements. However, this would not eliminate the adverse impact of existing fencing restricting distribution and entanglement mortality, especially during winter as snow build-up on fences complicates migration, causing some mortality.

Mule Deer. The implementation of Alternative 7 would be expected to increase mule deer populations above the desired population level in the short and long terms, however, harvest strategies would be implemented to maintain population at the desired level (TABLE 2-37).

Food. The sagebrush-grass and mountain shrub vegetation types (TABLE 2-39) are the primary habitat types common to the deer populations within the Sandy area. Mule deer utilize primarily shrub forage in fall and winter. Forbs are also important forage to mule deer in the spring-summer period (Kufeld 1973). Anderson and Wilbert (1958) and Blair (1967) documented the importance of sagebrush species and other shrubs as winter forage for mule deer in southwestern Wyoming. The size of habitat types providing seasonal forage for mule deer are not anticipated to change in the short term. With the maintenance of shrub composition objectives for mule deer winter habitat and forb composition on summer habitat, it is anticipated that winter and summer forage production would remain about the same as the current situation over the long term (TABLES 2-27 and 8-15).

Competitive forage reservations consistent with Wyoming Game and Fish Department population estimates have been made on each allotment to accommodate these mule deer numbers. Since it is assumed activation of nonuse would not be allowed for the alternative, this would also reduce competition for forage and space between mule deer and livestock. At the current livestock use levels and seasons of use proposed for this alternative (TABLE 8-97) the degree of competition is expected to be insignificant.

In the short term, forage available to mule deer on summer habitat would increase as a result of increased water developments on summer habitat. In the long term, yearlong forage availability would be increased as a result of improved riparian habitat resulting from decreased livestock use of riparian areas. Burning and block-cutting treatments in aspen associations (MAP 8-6) would be expected to increase the quantity and quality of spring-summer-fall forage (shrubs and forbs) in the Bar X, Gold Creek, Little Prospect, Steamboat Mountain, Bush Rim, Continental Peak, White Acorn, and Prospect Mountain Allotments over the long term.

Cover. Burning and block-cutting in aspen associations would increase cover and forage in the long term by providing a diversity of growth stages and classes of vegetation. Yearlong cover in the long term would also increase as a result of riparian habitat improvement.

Water. Water availability to deer on summer habitat would increase in the short term. Increased water availability on deer summer habitat would promote better distribution and use in the short and long terms and would increase available forage on winter habitat.

Migration and Space. Conflicts due to spatial needs between livestock and deer would be expected to decrease with better summer habitat distribution as affected by water development and habitat improvement. Better summer range distribution of deer would decrease conflicts with other big game and livestock and in combination with other factors (i.e., increased water availability, sustained yearlong forage quality, and decreased predation effects), in the long term could result in increased fawn survival and in an increased annual sustained yield of harvestable mule deer.

Elk. Alternative 7 would result in an increase in elk populations in both the short and long terms above the desired population level, however, harvest strategies would be implemented to maintain populations at current levels which reflect the desired Wyoming Game and Fish Department management level.

Food. The conifer, mountain shrub, sagebrush-grass, and meadow vegetation types (TABLES 2-39) are common in the elk habitat in the Sandy area. Grasses in these types are the primary forage plants utilized by elk. The existing condition of this habitat is primarily fair to good with a static to upward apparent trend (TABLES 2-28 and 2-31). These vegetation types would not be expected to change in size to any significant degree with implementation of this alternative, and the condition of the range should remain about the same as at present in the long term.

Forage reservations consistent with Wyoming Game and Fish Department population estimates have been made on each allotment to accommodate the elk numbers. Since it is assumed activation of livestock nonuse would not be allowed, competition for forage and space between elk and livestock would be the same as at present. Forage production for elk over the total Sandy area would be expected to remain at about the same level as at present over the long term (TABLE 2-27).

Long-term forage availability and production in crucial winter habitat would not be expected to change from the current situation. There would be some competition over the long term for winter elk forage by cattle during the summer and fall on a portion of the Prospect Elk Herd Unit (APPENDIX 8A) crucial winter habitat, especially on the Little Sandy River area. It is anticipated that this impact would be equalized by the minimized competition with livestock on other portions of the Prospect and Steamboat Elk Herd Units (Gold Creek, Little Sandy, Little Prospect, Steamboat Mountain, Red Desert, Bush Rim, Pacific Creek, Sands, and White Acorn Allotments).

In the short term water developments on big game summer habitat would increase available elk forage on winter habitat through decreased competition with livestock in the summer-fall on elk crucial winter range.

Cover. Riparian exclosures and burning and block-cutting would be expected to increase cover for elk in the long term.

Water. An increase of water availability in the short term would be expected as a result of water development on big game summer habitat. This would decrease competition with livestock in the short term as well as allow access to new forage in summer habitat through the long term.

Migration and Space. Water developments in summer habitat would increase livestock and elk distribution and decrease their competition for space through the long term.

Moose. Current population levels as estimated by the Wyoming Game and Fish Department are approximately 23% below the herd management objectives (APPENDIX 8A). Alternative 7 would result in increased moose population in both the short and long terms above the desired population levels. Harvest strategies would be implemented to maintain desired population levels (TABLE 2-37).

Food and Cover. In the short term riparian study exclosures would result in a partial increase in quantity and quality of willow forage for moose. However, some degree of riparian habitat degradation would continue on unfenced riparian areas thus resulting in conditions similar to the existing situation. Additional riparian area protection in the long term could result in a significant increase in quantity and quality of forage and cover. Analysis of habitat improvements relative to forage and cover identified for mule deer and elk in this alternative would be applicable to moose. Herding of livestock to avoid excessive livestock use of unfenced riparian areas would result in a partial forage and cover increase by decreasing shrub damage and use by cattle in the short term. The primary moose habitat during the winter season is the meadow type. During the summer and fall seasons, moose utilize mountain shrub and conifer types in conjunction with the meadow types.

Water. Availability is adequate for moose as discussed in the proposed action explaining moose affiliation with riparian areas.

Sage Grouse. This alternative would be expected to increase populations in the long term resulting from fencing of existing and proposed waters and riparian habitat improvement. This would increase plant and insect forage and plant cover for young sage grouse in the summer, consequently increasing young survival and sage grouse numbers.

Food and Cover. The sagebrush-grass and wet meadow vegetation types are the primary habitat for sage grouse. The size of these types would not be expected to change with implementation of this alternative. Based on the food and cover analysis of the other game species common to this vegetation type, adequate forage and cover would be available for sage grouse population maintenance.

Water. The additional water developments on summer habitat would be expected to benefit sage grouse by increasing the summer-fall distribution.

Space. Competition for space, especially between sage grouse broods, would be reduced because of livestock distribution among water developments. This could conceivably increase sage grouse numbers through decreased mortality and increased survivability.

Waterfowl. Duck brood rearing success would be expected to improve under this alternative as the survivability of ducklings would increase due to riparian area improvements. Forage and upland nesting cover would be enhanced in the long term and competition for space would be reduced because of the fencing of the riparian habitat. Upland nesting cover adjacent to fenced riparian areas would not be expected to change in the short term.

Nongame. Alternative 7 would be expected to increase nongame species diversity and increase current numbers through the long term. Of major importance in the management of nongame species is maintenance of maximum species diversity at levels that meet ecological and recreational demands, including the ability of each species to perpetuate itself.

The principal vegetation type in the Sandy area is sagebrush-grass. Species such as Brewer's sparrow, sage thrasher, and green-tailed towhee are totally dependent upon this vegetation type. Riparian habitat common to the Sandy area produces the greatest density and diversity of wildlife species. Many species would not occur in the Sandy area without the riparian habitat.

Cottonwoods located along the Green River are a unique and important habitat type for nongame birds that would benefit through implementation of this alternative because of reduced livestock use. Water development and habitat improvements (i.e., riparian study exclosures, burning and block-cutting), would increase vegetation species diversity and age and form class dissimilarities (vertical and horizontal). The result would be positive for wildlife by increasing availability of habitat niches, forage production, and cover. This would be expected to be most important, particularly in relation to riparian management, in the long term as cooperative studies establish trends and indicate management strategies which would be expected to improve habitat.

Threatened and Endangered Species

The bald eagle, peregrine falcon, and black-footed ferret are all endangered species. The first two currently occur in this area, and the occurrence of the ferret has not been thoroughly investigated. Riparian habitat is important to the bald eagle and peregrine falcon and any decline in quantity or quality of this habitat can be considered a significant impact upon these species. There is evidence that some bald eagles feed on carrion in winter (per. comm., WGFD 1978). Any decline in quantity of winter habitat for big game is likely to decrease the number of wintering animals and thus the potential food supply for bald eagles.

The white-tailed prairie dog is usually found in sagebrush vegetation types. Since these prairie dogs are considered primary prey for blackfooted ferrets, impacts to prairie dogs from habitat reduction would also impact ferrets.

Food, Cover, Water and Space. These species are largely dependent upon small mammals and birds as a food source and are impacted by the fluctuation in the popula-

tions of those animals. The nongame population levels would be expected to increase in the long term; therefore, these endangered species should have increased prey available.

Waterfowl, shore birds and other riparian-associated small birds constitute major food items for the peregrine falcon. Long-term improvement of riparian habitat quality would increase the food base for the peregrine falcon. Nesting site availability for the peregrine falcon would be expected to remain similar to the existing situation.

This alternative is anticipated to maintain the present quantity and quality of big game winter habitat, thus maintaining a carrion food base for the bald eagle in winter through the long term. As a result, a long-term increase in wintering bald eagle numbers would be anticipated. Long-term improvements of riparian habitat would increase the production and survivability of riparian cottonwood trees on portions of the Green River and Big Sandy River; thus, increasing bald eagle nesting site availability.

The occurrence of the black-footed ferret in the area has not been thoroughly investigated. With implementation of this alternative, the status of the white-tailed prairie dog is expected to remain similar to the existing situation in the long term.

Aquatic

Short Term. As proposed by Alternative 7, grazing use of the Sandy area will be esentially the same over the short term as that use occurring at the present time. For this reason the existing conditions discussed in Chapter 2, Aquatic Wildlife, would be expected to continue through the short term. In association with the existing stream habitat conditions shown on TABLES 2-55 and 2-56, apparent stream habitat trends are noted in TABLE 8-112. With continued season-long use, and in the absence of any rest treatments, the effects on stream habitat would be the same as discussed in Chapter 3, Aquatic Wildlife, Treatment A, leading to a continued decline in habitat area-wide (refer to TABLE 3-43, FIGURE 3D-3, and FIGURE 3-8).

Therefore, it would be anticipated that the area-wide long-term stream habitat conditions shown in TABLE 3-46 would be attained within the short term. However, the riparian management and study areas proposed would encompass approximately 26 and 6 miles of stream habitat respectively. This would amount to 22% of the stream miles on NRL; 17% of the total stream miles managed by the BLM (NRL and Bureau of Reclamation withdrawals); or 9% of the stream miles in the entire Sandy area. Habitat recovery and improvement in these 32 miles would be expected to offset the anticipated impacts area-wide to a point where the short term decline in quality shown in TABLE 3-46 would prevail.

Long Term. Assuming present levels of livestock use and no changes in class of livestock from the present, it is estimated that 5 to 15 years of rest will generally be required for stream habitat to recover its full potential quality. Implementation of grazing systems which incorporate sufficient rest to compensate for the intensity of use could improve stream habitat outside of the riparian management or study areas to present conditions (TABLE 3-46). Regardless of the type of grazing system utilized, a minimum of two years rest must be provided for all habitat elements (streambank stabilization, riparian soil compaction, willow or aspen establishment and regrowth, etc.) to offset the impacts incurred during the grazing treatment. If this rest is provided it is anticipated that stream habitat quality area-wide would be in an upward trend.

Burning or cutting of 5,000 to 8,000 acres of aspen through the long term could have impacts on beaver associated stream ecosystems if it was performed within 300 feet of any drainage. Accelerated sedimentation resulting from such treatments could also pose an impact to spawning success of game fish.

Wild Horses

Wild horse numbers would be reduced to the management levels recommended in the proposed action (800 head). However, this alternative proposes to allow the horses to run in the areas they were found at the time the 1971 Wild, Free-Roaming Horse and Burro Act was passed. These are essentially the same areas as the horses are found today. Forage reservations for horses would be as shown in TABLE 8-97.

Under this alternative there would be decreased competition with livestock and wildlife for forage and water which could result in improved condition of the horses. Impacts from the limited construction of water developments would be similar to impacts as discussed in the proposed action. Fencing or shutting off of water developments to force movements in wildlife and livestock would also have impacts on wild horses similar to those discussed in the proposed action. Mainly this would be from also forcing movement of the wild horses.

Cultural Resources

The maintenance of livestock at their present level of use would not increase the amount of damage to cultural resources currently taking place in the Sandy area through trampling. The elimination of winter sheep use in certain areas would lead to considerably less trampling in potential sheep bedding areas because trampling in protected draws and drainages would be reduced. The disallowance of activating nonuse would postpone increased trampling for eleven years and reduce it thereafter. That trampling which remains could lead to erosion along cattle trails and water sources which would damage sites by the vertical and horizontal displacement of artifacts. Over a period of twenty years, erosion due to livestock trampling could result in a 15 to 20% loss of archeological sites, as sites would be gradually eroded leading to a displacement of artifacts and the loss of other data vital to the interperation of archeological sites.

TABLE 8-112

APPARENT STREAM HABITAT TREND UNDER ALTERNATIVE 7[1/]

Allotment Stream	Apparent Habitat Trend Stable	Declining
Bar X	*	*
Fish Creek		
Fish Creek		100%
Gold Creek		
East Fork Sweetwater	40%	60%
Jack Creek	52%	48%
Gold Creek	42%	58%
Sweetwater River	36%	64%
Mill Creek (E. Fk. Tributary)	43%	57%
Little Sweetwater		100%
Tributary A - Little Sweetwater		100%
Clear Creek	21%	79%
Mill Creek (Sweetwater Tributary)	*	*
Blair Creek	*	*
Fish Creek		100%
Pine Creek	10%	90%
Little Pine Creek		100%
West Willow		100%
Willow	100%	
Dead Ox		100%
Little Sandy-Little Prospect		
Little Sandy River	20%	80%
Lander Creek	*	*
Ord Creek	57%	43%
Steamboat Mountain		
Little Colorado		
Green River		100%
Big Sandy River	26%	74%

Allotment Stream	Apparent Habitat Trend Stable	Declining
Red Desert		
Bush Rim		
Continental Peak		
Sweetwater River	36%	64%
Oregon Slough	--*	--*
Pacific Creek		
Jack Morrow Creek		100%
Pacific Creek	22%	78%
Sands		
White Acorn		
Blucher Creek		100%
Tie Creek		100%
Prospect Mountain		
Big Sandy River	33%	67%
Dutch Joe Creek		100%
Little Sandy River	20%	80%
Reservoir		
Big Sandy River		100%
Poston		
Pine Creek		
A. Pine Creek	9%	91%
B. Dead Ox Creek	100%	
Custodial Pastures		
C-21 Lander Creek	*	*
C-26 Squaw Creek		100%
Grass Creek		100%
C-6 Pacific Creek	100%	

1/ Apparent stream habitat trend is an estimation of the amount of stream habitat quality as recorded by the stream survey, which is in an apparently stable condition or is declining. This is based on the existence and extent of change factors such as accelerated erosion, trampling, sedimentation, channel changes, etc.

* Information not available or totally nonNRL stream bottom.

Fences around water developments would create a slight visual intrusion in the area and slightly damage any archeological sites they were built across. The construction of 31 new water developments would damage or destroy any archeological sites they are built upon as well as lead to increased trampling near them.

The burning of 5,000 to 8,000 acres would destroy any standing wooden historic or prehistoric structures in the burned area which might have been missed during survey. It would create a temporary visual intrusion. In addition it would damage lithic artifacts through spalling caused by extreme heat. The potential archaeomagnetic and thermoluminescent dating data contained in prehistoric fire hearths in the burned area could be destroyed if the fire was hot enough.

Visual Resources

The visual effects of this alternative are site-specific and are related to water project developments, riparian fencing, and concentrated trampling in stream bottoms and near water developments. These effects currently exist throughout the landscape. Change in the visual resource for the area, as a whole, would be negligible. Analysis of visual effects was accomplished by using the contrast rating system. The contrast ratings are shown on TABLE 2-65.

Recreation

Recreation experiences would change in quality in the Sandy area. The discussion of changes under Alternative 1 applies to this alternative. The impacts to visitor use days are shown on TABLE 8-113. They are based upon the same areas as defined in the proposed action. Shifts of boundary lines would have an insignificant effect upon visitor use figures by allotment and no effect upon the aggregate impact of this alternative on recreation.

TABLE 8-114 shows long-term visitor use days under Alternative 7. A detailed analysis is available for review upon request from the Rock Springs District Office.

A potential hazard from soil and waterborne diseases and parasites that are related to livestock grazing may occur to recreation seekers. It has not been quantified because of lack of data.

Wilderness Resource

Potential impacts to the wilderness resource would result from the proposed range improvements. Where these potential impacts exist, implementation of these components of the alternative would be postponed until the studies and public meetings required under the Federal Land Policy and Management Act (FLPMA) have been completed.

Livestock Grazing

Not allowing the activation of nonuse would give a short-term use of 78,889 (includes trailing) AUMs on Federal range as compared to the proposed action's 112,913 AUMs of Federal range use (TABLES 8-97 and 1-4). In the long term there would be a potential for 138,066 AUMs of use on Federal range. This is provided that allotment analysis shows the nonuse could be activated.

Based on the assumption that in the short term there would be no activation of nonuse, the 10 allottees (Chapter 2 Livestock Grazing section) presently taking 100% nonuse (TABLE 2-69) while awaiting conversions from sheep to cattle use would lose any potential grazing use they may have for the next eleven years. There are five allottees (TABLE 2-69) taking from 45 to 87% nonuse while awaiting conversions from sheep to cattle use or for various other reasons that would lose the use of these AUMS. The potential for regaining nonuse AUMs by the end of the long term cannot be analyzed for its impact since it is not known which operators, if any, would be restored nonuse AUMs in the long term.

Since much of the present nonuse has been taken for a number of years in many cases, it is assumed the operators have already made adjustments in their year round operations. Operators would not necessarily be forced out of the livestock business under this alternative. Those operators not taking partial or full nonuse would not be affected by this element of the alternative.

There would be some economic loss to operators taking some or all nonuse due to a loss in borrowing power that their grazing permit may have. The economic impacts are discussed in more detail in the socioeconomic analysis.

No sheep use from October 16 to April 15 would affect those sheep permittees in the Little Colorado, Sands, and Reservoir Allotments. Use of the Reservoir Allotment would be limited to approximately the north half for the last two weeks of the permittees' grazing season. Restricting the northern part of the Big Sandy River from sheep use could cause some operators to haul water until additional water is developed. This is the area some operators normally use. The flexibility of the permittees to let the sheep graze toward the winter range through the Sands Allotment would be eliminated. They would have to trail the sheep into the areas open to sheep grazing. There would be no affect on the present use from limiting water developments on crucial winter ranges since existing waters will continue to be maintained.

Farming

Approximately 20% of the acreage producing hay in the Sandy area is controlled by 16 of the 48 permittees on the Sandy area. The remaining 32 permittees have base properties outside the Sandy area, some of which is used for hay production. Presently approximately 50% of the hay produced in the Eden Valley is sold else-

TABLE 8-113

PERCENT CHANGE IN VISITOR USE FROM EXISTING CONDITIONS UNDER ALTERNATIVE 7

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy-Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sands	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	Change in Percent Use
Sand Dune Rally											0						0
Recreation Vehicle			0	0	0		0	0	0	0	0	0	0			0	+49
Camping- Trailer	0	0	0	0	0	0		0	0	0		0	0	0	0	0	-4
Dry Camp- Tent	-26	0	+11	0		+100						+11	+11	+11	+10	0	+69
Tent Camping	-5	0	0	0		+376			0			0	+5	+5	+6	0	-4
Picnic- Dry Camp	+38	0	+11	0							+10	+11				0	+4
Picnic	-7	0	0	0					0			0		0		0	0
Camping-Camping Areas			0			0						0	0	0		0	0
Picnic- Picnic Areas			0			0						0	0	0		0	0
Hunting:																	
Moose	0	0	0						0			0	+67	+50	+50		+33
Elk	0	0	-10	0	0			0		0	0	0	0	0	0	0	-4
Deer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+4
Antelope	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grouse			0	0					-11			0	0				-7
Sage Grouse	0	0	+19	0	+25			0		-10		+25	+32			0	+11
Dove			0		0					-10	-13			0	+50	0	-7
Goose/Duck						0								+23			+3
Cottontail						+11					0						+6
Rock Collecting	0			0	0	+100		0	0	0				0			+18
Fishing- Stream	0	0	-10	0					+12			0	+100	+33	+100	-9	+16
Floatboat/Canoe	0	0	+24	0		+25			0			+5	+24	+24	+271		+42
Fishing- Reservoir						0								0			0
Boating						0								0			0
Waterskiing						0								0			0
Swimming						0								0			0
Snow Play	0	0	0									0				0	0
Cross-Country Skiing			-11	0								0					-9
Snowmobile			+5			-5					0	-5					-2
Sightseeing- Highway	0		0	0		0				0	0	0		0	0	+11	0
Sightseeing- General	0	-40	-40	0	0	-67	0	0	0	0	0	+25	+25	0		-41	+3
CHANGE IN TOTAL USE	-1	-6	-4	0	0	+7	0	0	0	-2	0	+6	+25	+2	+66	0	+5

TABLE 8-114

PROJECTED VISITOR DAYS PER YEAR UNDER ALTERNATIVE 7

Recreation Activity	Bar X	Fish Creek	Gold Creek	Little Sandy Little Prospect	Steamboat Mountain	Little Colorado	Red Desert	Bush Rim	Continental Peak	Pacific Creek	Sandy	White Acorn	Prospect Mountain	Reservoir	Poston	Pine Creek	TOTAL
Sand Dune Rally											3,700						3,700
Recreation vehicle			360	803	278	1,912	805	68	35	233	248	315	713			15	5,785
Camping-Trailer	622	59	12,323	6,788	29	212		440	630	604		8,626	5,267	873	482	46	37,001
Dry Camp Tent	29	4	856	424		1,520						599	365	62	33	3	3,895
Tent Camping	110	11	2,311	1,273					7			1,617	1,040	173	95	9	6,646
Picnic Dry Camp	11	2	50	60							74	31				2	230
Picnic	67	18	405	540					30			252		100		18	1,430
Camping-Camping Areas			1,200			5,834						100	700	7,875		100	15,809
Picnic-Picnic Areas			544			66						45	337	51		45	1,088
Hunting: Moose	1	1	1						1			1	5	3	3		16
Elk	1	20	394	39	20			37		12	7	90	167	4	41	30	862
Deer	2	3	60	132	33	202	10	62	9	19	17	79	191	6	74	4	903
Antelope	3	5	4	11	12	82	236	28	46	13	21	3	2	3	6	1	476
Grouse			8	2					41			6	6				63
Sage Grouse	29	22	607	2,529	60			95		292		1,523	794			4	5,955
Dove			9		12					37	28			4	3	2	91
Goose/Duck						328								58			386
Cottontail						195					131						326
Rock Collecting	355			412	14	700		225	273	231				48			2,258
Fishing-Stream	30	34	5,126	3,590					48			3,987	5,256	1,100	1,000	31	20,202
Floatboat/Canoe	117	33	269	173		1,291			17			158	371	247	806		3,482
Fishing-Reservoir						6,911								758			7,669
Boating						1,100								248			1,348
Waterskiing						62								102			164
Swimming						132								8			140
Snow Play	56	56	222									28				139	501
Cross Country Skiing			92	2								20					114
Snowmobile			111			37					411	210					769
Sightseeing-Highway	60		180	210		946				752	705	180		598	230	133	3,994
Sightseeing-General	85	28	967	4,477	771	229	549	419	395	100	2,000	3,995	5,779	10,186		13	29,993
TOTAL USE BY ALLOTMENT	1,578	296	26,095	21,465	1,229	21,759	1,600	1,374	1,532	2,293	7,342	21,865	20,993	22,507	2,773	595	155,296

where. Acreage and use of existing farmlands should not change detectably. Ownership of farmlands might be expected to change as some operators may decide to liquidate, consolidate, or relocate their operations in land sales, transfers, or exchanges.

Socioeconomic Conditions

This alternative would have several impacts to ranchers of the Sandy area. By Year 23, they could lose the availability of 60,159 AUMs per year. This could cause a loss of annual total income in the region of $1,273,867. Recreation income would increase by $36,523 per year. Construction costs would total $482,200 for water developments and water fencing.

See APPENDIX 3E and Chapter 3, Socioeconomic Conditions section for methodologies used in this analysis.

SUMMARY OF IMPACTS

A summary of predicted long-term cumulative impacts from implementation of the proposed action and each of the alternatives is shown in TABLE 8-115 for the various resource elements.

Each of the proposals can be compared with the present situation in the first column. Relative values were established for those resources where it was impossible to predict specific estimates.

TABLE 8-115

SUMMARY AND COMPARISON OF IMPACTS OF PROPOSED ACTION AND ALTERNATIVES WITH PRESENT SITUATION

Resource	Component	Present Situation	Proposed Action	Alternatives 1	2	3	4	5	6	7
Soils	Total Sheet Erosion	8,378,610	6,925,953	8,324,429	7,849,386	8,873,427	7,797,663	6,925,953	6,925,953	7,933,856
	Grazing Intensities									
	Heavy-Severe (acres)	69,061	87,215	61,978	0	52,516	58,309	45,096	86,101	40,055
	Moderate (acres)	176,304	224,174	162,613	0	140,505	152,804	120,145	217,236	105,151
	Light (acres)	673,098	816,751	782,720	0	895,726	845,775	782,448	819,055	717,702
	Slight-Marginal (acres)	1,049,269	839,704	950,293	1,967,732	868,857	906,393	1,020,043	845,340	1,094,696
Water Resources	Sediment Yield (tons/year)	1,965,873	1,764,567	2,103,484	1,592,357	2,221,436	2,005,190	1,704,022	1,965,873	1,965,873
	Water Use (acre-feet/year)	79	152	117	0	107	119	93	152	85
	Channel Stability Rating[1]	100.4	99.0	109.0	90.0	112.0	103.0	95	99.0	102.0
	Ten-Year Storm Runoff (acre-feet)	29.5	21.0	31.1	17.1	36.6	33.4	20.5	25.2	31.1
Vegetation	Production Levels									
	Cattle (AUMs)	125,500	66,060	118,790	161,807	114,549	125,151	172,833	172,833	132,058
	(Pounds)	97,890,000	51,441,000	92,656,200	126,209,460	89.348,220	96,746,520	134,809,740	134,809,740	103,005,240
	Sheep (AUMs)	142,861	59,476	138,671	186,299	133,505	137,237	196,049	196,049	164,798
	(Pounds)	107,145,750	44,674,500	104,003,250	100,128,750	101,873,250	147,036,750	147,036,750	147,036,750	117,149,250
	Horses (AUMs)	93,560	9,600	62,899	89,287	59,664	51,290	75,337	57,337	73,092
	(Pounds)	87,204,000	8,640,000	56,608,100	80,358,300	53,697,600	46,161,000	67,803,300	67,803,300	65,782,800
	Antelope (AUMs)	146,427	9,690	146,054	189,730	146,054	158,093	191,123	191,123	165,900
	(Pounds)	117,525,777	7,810,140	117,719,524	152,922,380	117,719,524	127,422,958	154,045,138	154,045,138	133,720,236
	Deer (AUMs)	135,674	17,307	146,059	208,221	146,059	139,318	209,819	209,819	1,641,496
	(Pounds)	63,902,454	8,151,597	68,793,789	98,072,091	68,793,789	65,618,778	98,824,749	98,824,749	77,477,616
	Elk (AUMs)	54,134	5,270	59,327	75,581	59,327	60,070	82,265	82,265	61,001
	(Pounds)	29,232,360	2,845,800	32,031,720	40,813,740	32,036,580	32,437,800	44,423,100	44,423,100	32,940,540
	Moose (AUMs)	7,629	1,533	7,459	9,849	7,459	8,465	10,609	10,609	7,915
	(Pounds)	422,280	827,820	4,027,860	5,318,460	4,027,860	4,571,100	5,728,860	5,728,860	4,274,100
	Ground Cover Average									
	Sagebrush-Grass (%)	38	44	39	39	36	37	44	44	40
	Saltbush-Winterfat (%)	35	35	35	35	30	30	35	35	35
	Greasewood (%)	33	33	33	33	33	29	33	33	33
	Meadow (%)	71	77	72	80	65	71	77	77	79
	Grass (%)	27	30	26	27	22	25	30	30	27
	Perennial Forb (%)	15	16	15	15	15	16	16	16	15
	Mountain Shrub (%)	77	82	81	77	79	80	82	82	83
	Conifer (%)	72	76	73	78	73	68	76	76	72
	Range Condition (acres)[2]									
	Cattle Good	384,415	+	-	+	-	-	+	+	-
	Fair	1,084,740	+	-	+	-	-	+	+	-
	Poor	498,577	-	+	-	+	+	-	-	+
	Marginal Use	0	0	0	0	0	0	0	0	NC
	Sheep Good	428,796	+	-	+	-	-	+	+	+
	Fair	1,409,560	+	+	+	+	+	+	+	+
	Poor	129,376	-	+	-	+	+	-	-	-
	Marginal Use	0	0	0	0	0	0	0	0	NC
	Wild Horses Good	374,124	+	-	+	-	-	+	+	+
	Fair	934,063	+	-	+	+	+	+	+	+
	Poor	431,303	-	+	+	+	+	-	-	-
	Marginal Use	221,042	-	NC	NC	-	-	-	-	-
	Pronghorn Good	1,242,099	+	-	+	-	-	+	+	-
	Fair	626,461	+	+	+	+	+	+	+	+
	Poor	98,869	-	+	-	+	+	-	-	+
	Marginal Use	303	-	NC	NC	-	-	-	-	NC
	Deer Good	684,864	+	-	+	-	-	+	+	-
	Fair	306,806	+	-	+	+	+	+	+	-
	Poor	59,451	-	+	-	+	+	-	-	+
	Marginal Use	916,611	-	NC	NC	-	-	-	-	NC
	Elk Good	239,634	+	-	+	-	-	+	+	-
	Fair	186,813	+	-	+	-	-	+	+	-
	Poor	44,541	-	+	-	+	+	-	-	+
	Marginal Use	1,496,749	-	NC	NC	-	-	-	-	NC
	Moose Good	91,980	+	-	+	-	-	+	+	-
	Fair	109,049	+	+	+	+	+	+	+	+
	Poor	19,168	-	+	-	+	+	-	-	+
	Marginal Use	1,747,535	-	NC	NC	NC	NC	-	-	NC
Apparent Trend (acres)[2]										
Cattle	Upward	365,249	+	-	+	-	-	+	+	-
	Static	1,442,148	+	-	+	-	-	+	+	-
	Downward	160,335	-	+	-	+	+	-	-	+
	Marginal Use	0	0	0	0	0	0	0	0	NC
Sheep	Upward	23,747	+	-	+	-	-	+	+	+
	Static	1,562,400	+	-	+	-	-	+	+	+
	Downward	107,640	-	+	-	+	+	-	-	-
	Marginal Use	23,747	-	NC	NC	NC	NC	-	-	NC

TABLE 8- 115 (Continued)

SUMMARY AND COMPARISON OF IMPACTS OF PROPOSED ACTION AND ALTERNATIVES WITH PRESENT SITUATION

Resource	Component	Present Situation	Proposed Action	Alternatives 1	2	3	4	5	6	7
	Apparent Trend (acres)2/									
	Wild Horses-Upward	322,290	+	-	+	-	-	+	+	-
	Static	1,252,164	+	-	+	-	-	+	+	+
	Downward	155,336	-	+	-	+	+	-	-	+
	Marginal Use	227,942	-	0	-	-	-	-	-	NC
	Pronghorn Upward	500,648	+	-	+	-	-	+	+	-
	Static	1,420,158	+	-	+	-	-	+	+	+
	Downward	46,923	-	+	-	+	+	-	-	+
	Marginal Use	3	-	0	-	-	-	-	-	-
	Deer Upward	426,075	+	-	+	-	-	+	+	-
	Static	608,101	+	-	+	-	-	+	+	+
	Downward	19,348	-	+	-	+	+	-	-	+
	Marginal Use	914,208	-	0	-	-	-	-	-	-
	Elk Upward	162,294	+	+	+	-	-	+	+	NC
	Static	298,229	+	+	+	-	-	+	+	+
	Downward	8,722	-	-	-	+	+	-	-	+
	Marginal Use	1,498,487	-	0	-	-	-	-	-	-
	Moose Upward	55,160	+	+	+	-	-	+	+	NC
	Static	161,806	+	+	+	-	-	+	+	+
	Downward	9,434	-	-	-	+	+	-	-	+
	Marginal Use	1,741,326	-	0	-	-	+	-	-	-
Wildlife	Population 7/									
	Pronghorn (numbers)	9,553	9,400	8,750	25,000	8,075	8,600	9,553	9,900	9,900
	Deer (numbers)	5,178	5,700	5,200	13,700	4,680	2,350	5,178	6,600	7,400
	Elk (numbers)	1,165	1,165	1,165	3,500	1,000	1,165	1,165	1,200	1,165
	Moose (numbers)	56	56	56	270	53	50	56	58	73
	Fish (numbers per mile)	700-1,800	300-950	700-1,800	1,000-2,000	200-800	200-800	300-950	400-1,100	700-1,800
	Spawning Habitat									
	Good (miles)	24	16	24	28	8	8	24	19	24
	Fair (miles)	35	24	35	40	22	22	35	30	35
	Poor (miles)	100	103	100	115	109	109	100	103	100
	Virtually None (miles)	111	130	111	87	132	132	111	119	111
	Resident Habitat for Fish									
	Good (miles)	27	19	27	31	19	19	27	22	27
	Fair (miles)	171	133	171	197	140	140	171	152	171
	Poor (miles)	30	68	30	34	69	69	30	51	30
	Virtually None (miles)	43	51	43	9	43	43	43	46	43
Wild Horses	Population	1,682	800	800	800	800	800	800	800	800
	Free Roaming Nature3/	+High	-Low	-Low	+High	-Low	-Low	-Low	-Low	-Low
	Water Availability	-Low	+Moderate	-Low	+Moderate	+Moderate	+Moderate	+Moderate	+Moderate	-Low
Cultural Resources	Archeological3/	-Low	-Severe	-Severe	+Low	-Moderate	-Severe	-Moderate	-Low	-Low
	Historical3/	-Low	-Moderate	-Low	+Low	-Low	-Moderate	-Low	-Moderate	-Low
Visual Resources	Class II Objectives3/	-Low	-Low	-Low	-Low	-Low	-Low	-Low	-Low	-Low
Recreation Resources	Visitor Use (days/year)	148,165	275,695	143,599	309,757	143,016	199,736	282,643	282,643	155,297
Livestock Grazing	AUMs Permitted									
	Start of Program	86,105	125,516	144,401	0	123,117	122,260	74,613	125,516	89,382
	Long-Term	0	166,550	125,551	0	113,775	121,808	99,846	166,550	89,382
Socio-Economic	Income From AUMs 4/ Long-Term AUMs (dollars)	3,182,348	$3,526,696	$2,658,542	0	$2,409,186	$2,540,492	$2,136,219	$3,526,696	1,908,482
	Range Improvements									
	Total Cost of Developments (dollars)4/		2,860,100	255,000	266,400	255,000	1,893,514	2,860,100	2,219,500	482,200
	Annual Rancher Maintenance Costs (dollars)4/		91,210			22,060	52,890	91,210	88,359	
	Income From Recreation5/	735,000	+430,299	-27,835	+563,825	-29,901	+168,876	+473,106	+589,216	+36,523

1/ A potential exists for each allotment and the figure expressed here is relative to that potential (TABLE 3-12).

2/ Represents a general overview of the range condition and apparent trend expected over the long-term from the present situation: + = upward; - = downward; NC = no change; and 0 = no acres in that category.

3/ Numerical ratings are unquantifiable. Ranges have been established as indicators of impact level with adverse or beneficial qualities (+ and -). For example, +High indicates that the overall effects of the alternative on that facet of the resource is a high quality benefit; -Low would indicate an adverse impact of low degree, etc.

4/ Figures represent total dollars relative to each alternative, etc. Comparisons of actual differences are available for review at the Rock Springs District Office. These values have been multiplied by the District livestock multiplier.

5/ Represents average 1974-1975 actual use.

6/ Changes from existing. These values have been multiplied by the District livestock multiplier.

7/ Averages of the expected range.

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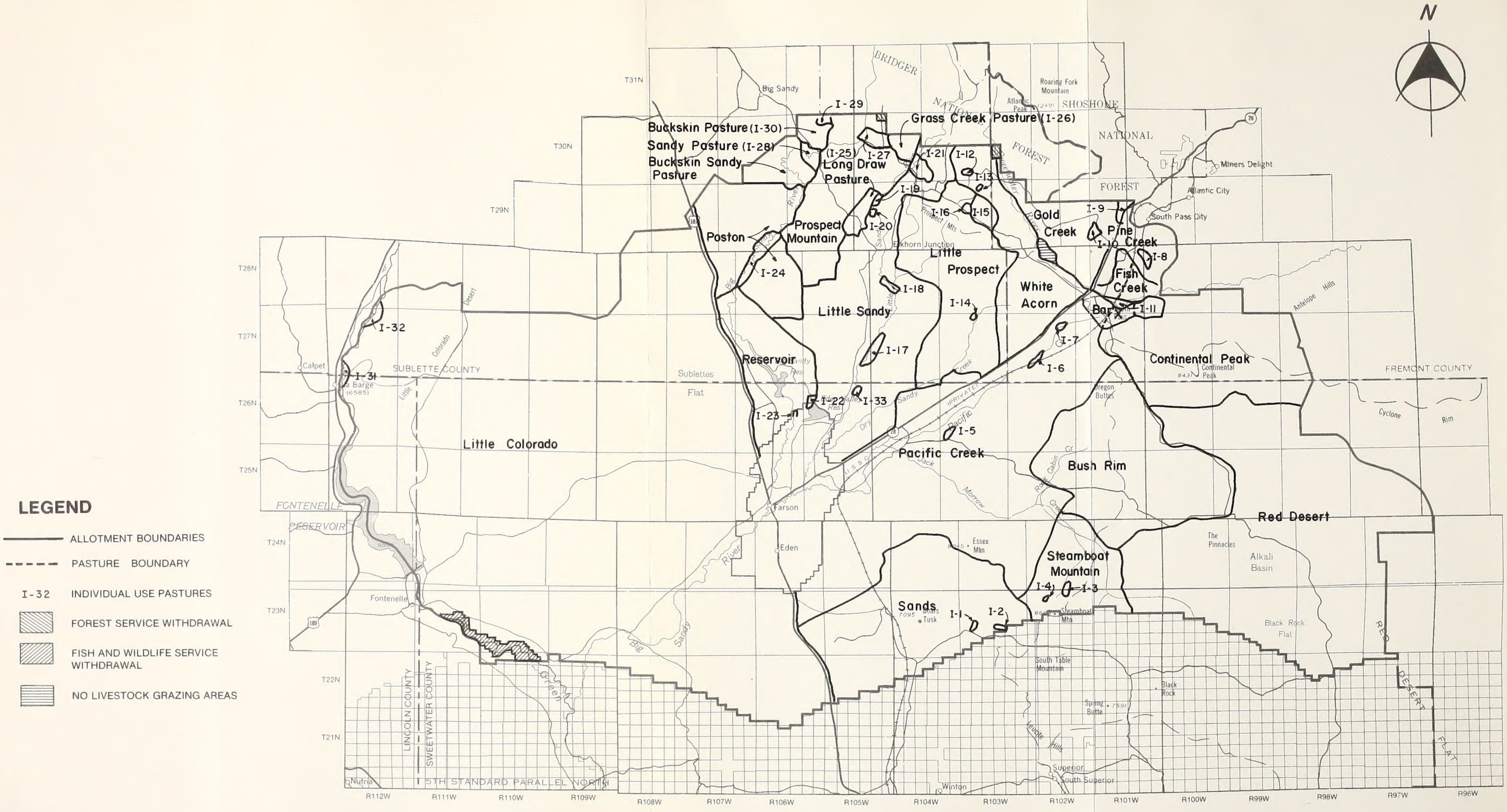
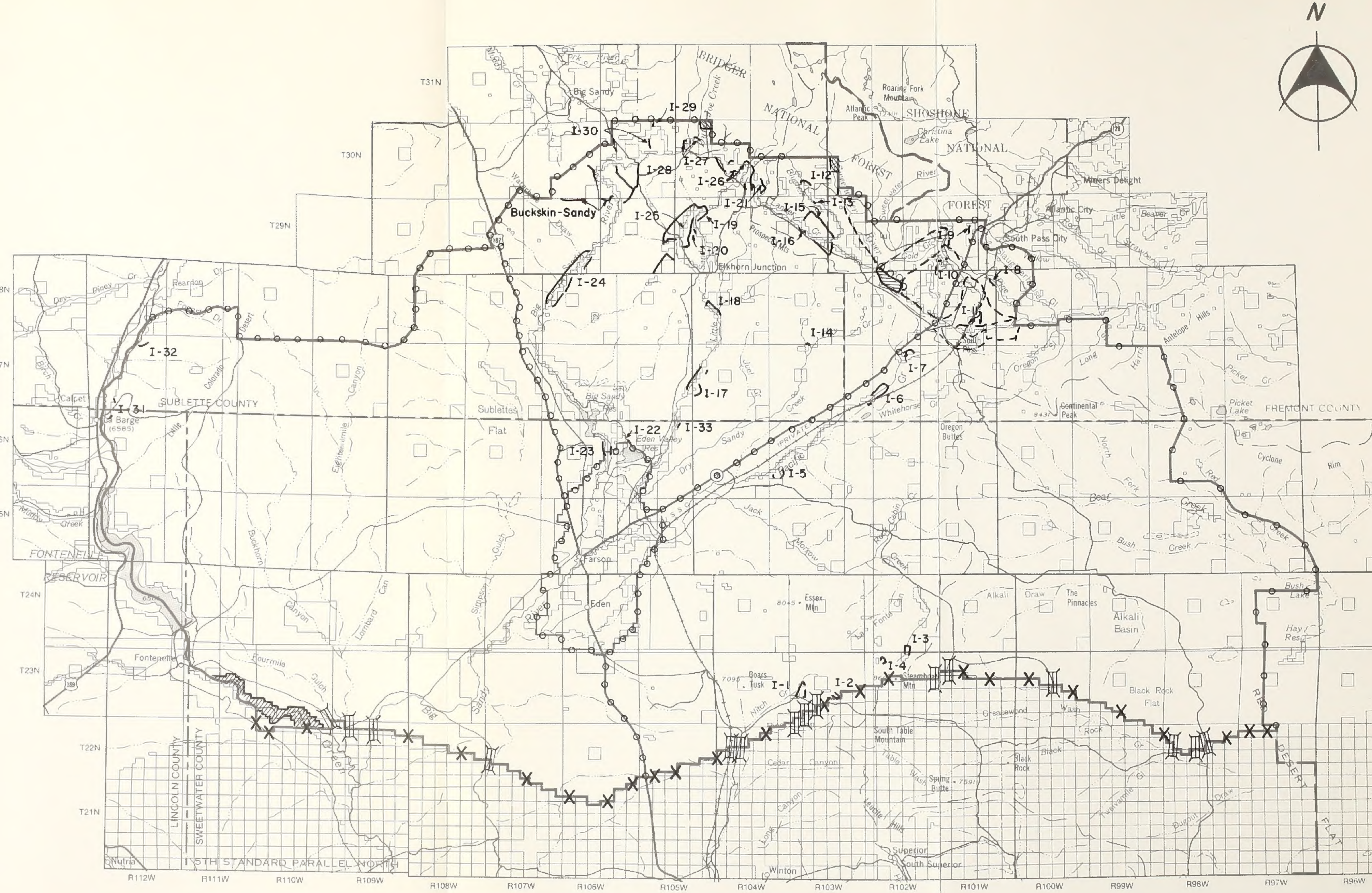


ALTERNATIVE NO. 1 — EXISTING ALLOTMENT BOUNDARIES

SANDY GRAZING
ENVIRONMENTAL STATEMENT

MAP 8-1



LEGEND

- - - - - BAR X, FISH CREEK, AND GOLD CREEK ALLOTMENT FENCES TO BE REMOVED

X X CHECKERBOARD BOUNDARY FENCE

INDIVIDUAL USE PASTURE FENCES THAT WOULD NEED TO BE REMOVED TO EXCLUDE N R L

CATTLEGUARDS

STATE AND OR PRIVATE LAND THAT WOULD NEED TO BE FENCED

FOREST SERVICE WITHDRAWAL

FISH AND WILDLIFE SERVICE WITHDRAWAL

NO LIVESTOCK GRAZING AREAS

I-12 INDIVIDUAL USE PASTURES

o o o o EXISTING FENCES TO REMAIN

Scale 1 : 500,000

1 inch equals approximately 8 miles

10 0 10 20 Miles

10 0 10 20 Kilometers

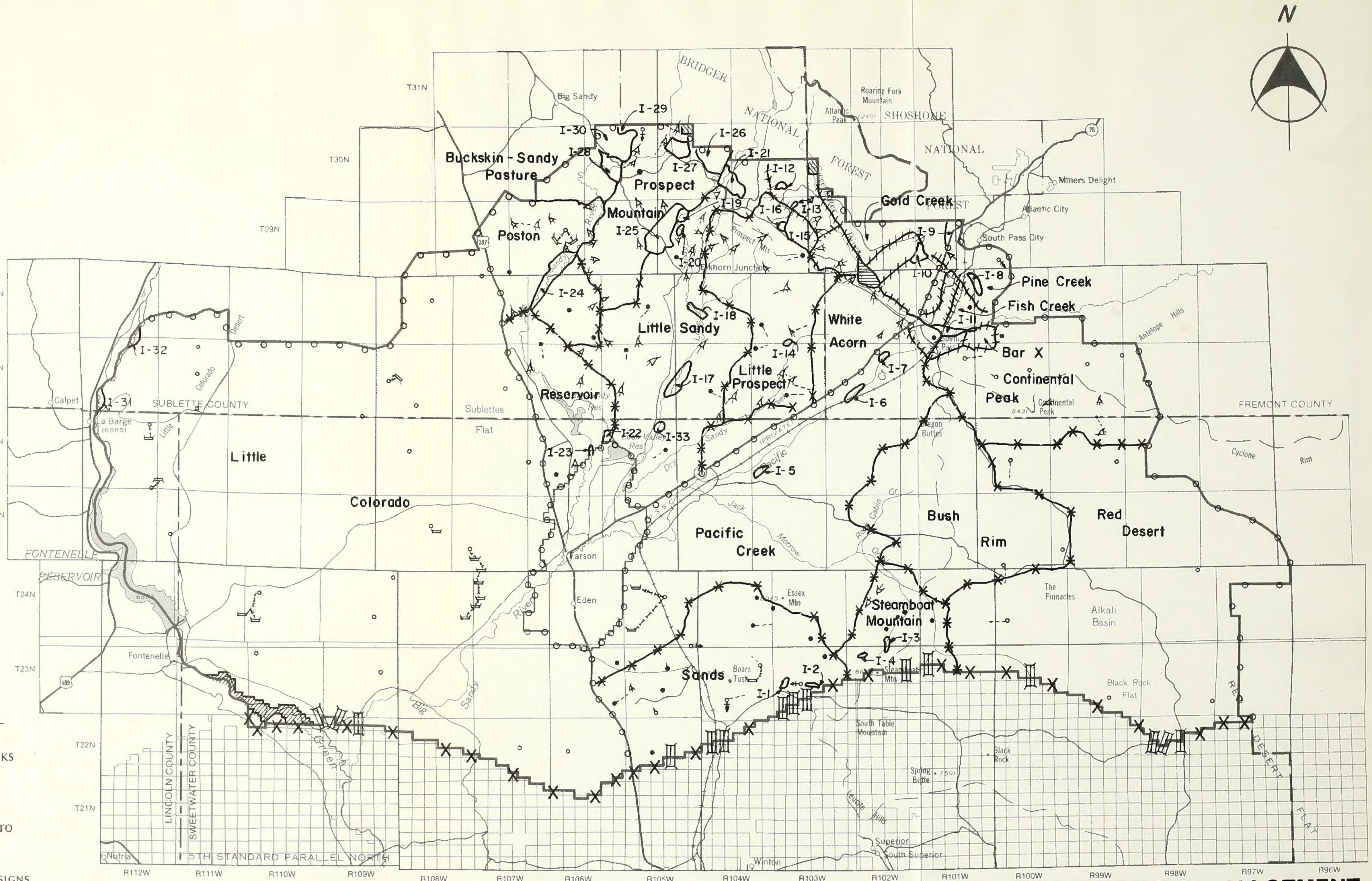
SANDY AREA BOUNDARY

ALTERNATIVE NO. 2 — FENCING REQUIREMENTS

SANDY GRAZING

ENVIRONMENTAL STATEMENT

MAP 8-2



LEGEND

- UNFENCED ALLOTMENT AND USE AREA BOUNDARY
- I-12 INDIVIDUAL USE PASTURES
- NO LIVESTOCK GRAZING (FENCED)
- FOREST SERVICE WITHDRAWAL
- FISH AND WILDLIFE SERVICE WITHDRAWAL
- EXISTING ALLOTMENT AND PASTURE FENCES (TO REMAIN)
- X X CHECKERBOARD BOUNDARY FENCE
- CHECKERBOARD FENCE CATTLEGUARDS
- EXISTING HIGHWAY R/W AND BOUNDARY FENCE (TO REMAIN)
- WATER DEVELOPMENTS
  - WELL
  - RESERVOIR - PIT
  - RESERVOIR - EARTH - FILL
  - PIPELINE AND STOCK TANKS
  - SPRINGS
  - 2-TRACK ACCESS TRAILS TO WATER DEVELOPMENTS
- ALLOTMENT BOUNDARY SIGNS

Scale 1 : 500,000

1 inch equals approximately 8 miles

10 0 10 20 Miles

10 0 10 20 Kilometers

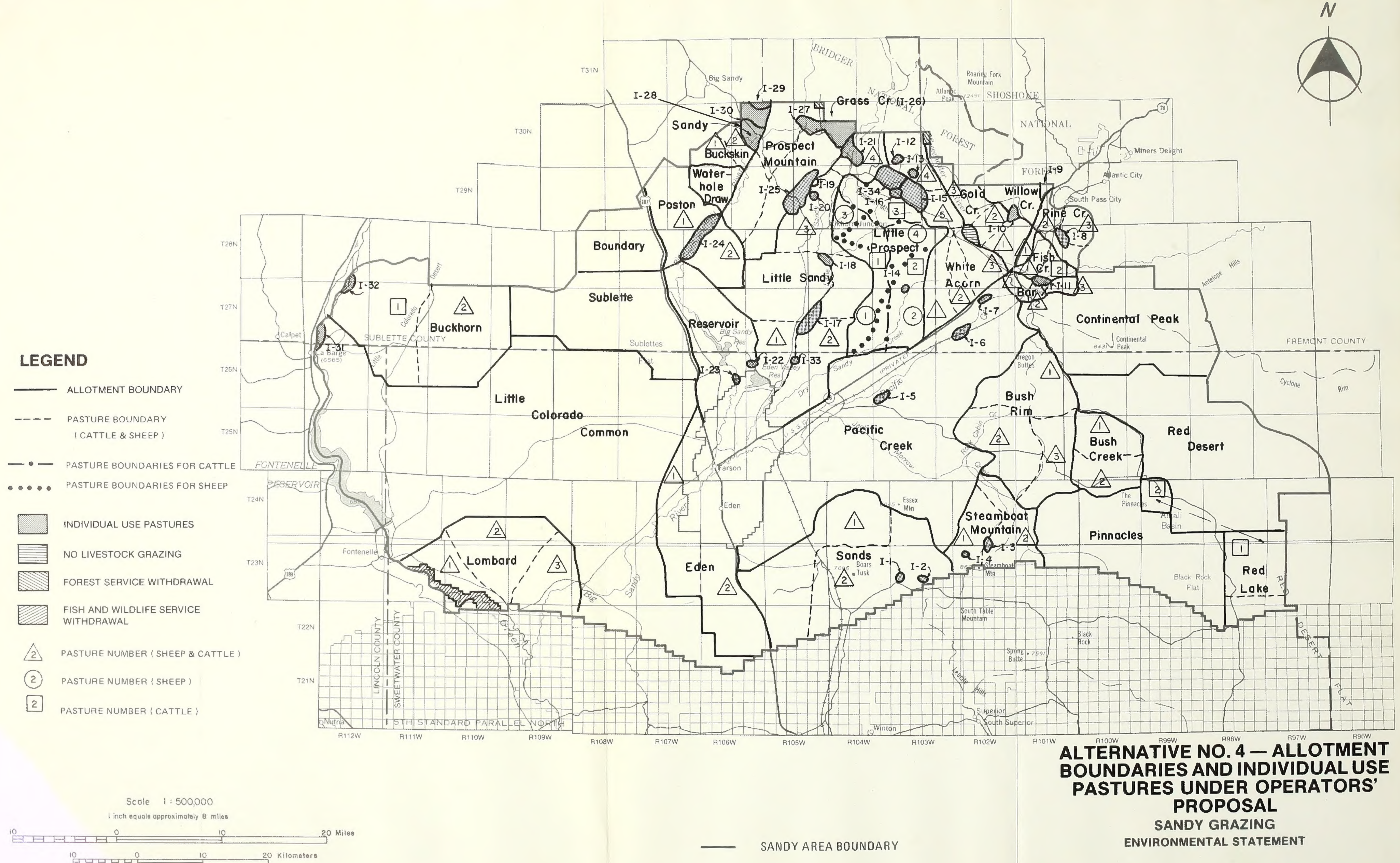
SANDY AREA BOUNDARY

ALTERNATIVE NO. 3 — ALLOTMENT BOUNDARIES, INDIVIDUAL USE PASTURES, AND RANGE IMPROVEMENTS

SANDY GRAZING

ENVIRONMENTAL STATEMENT

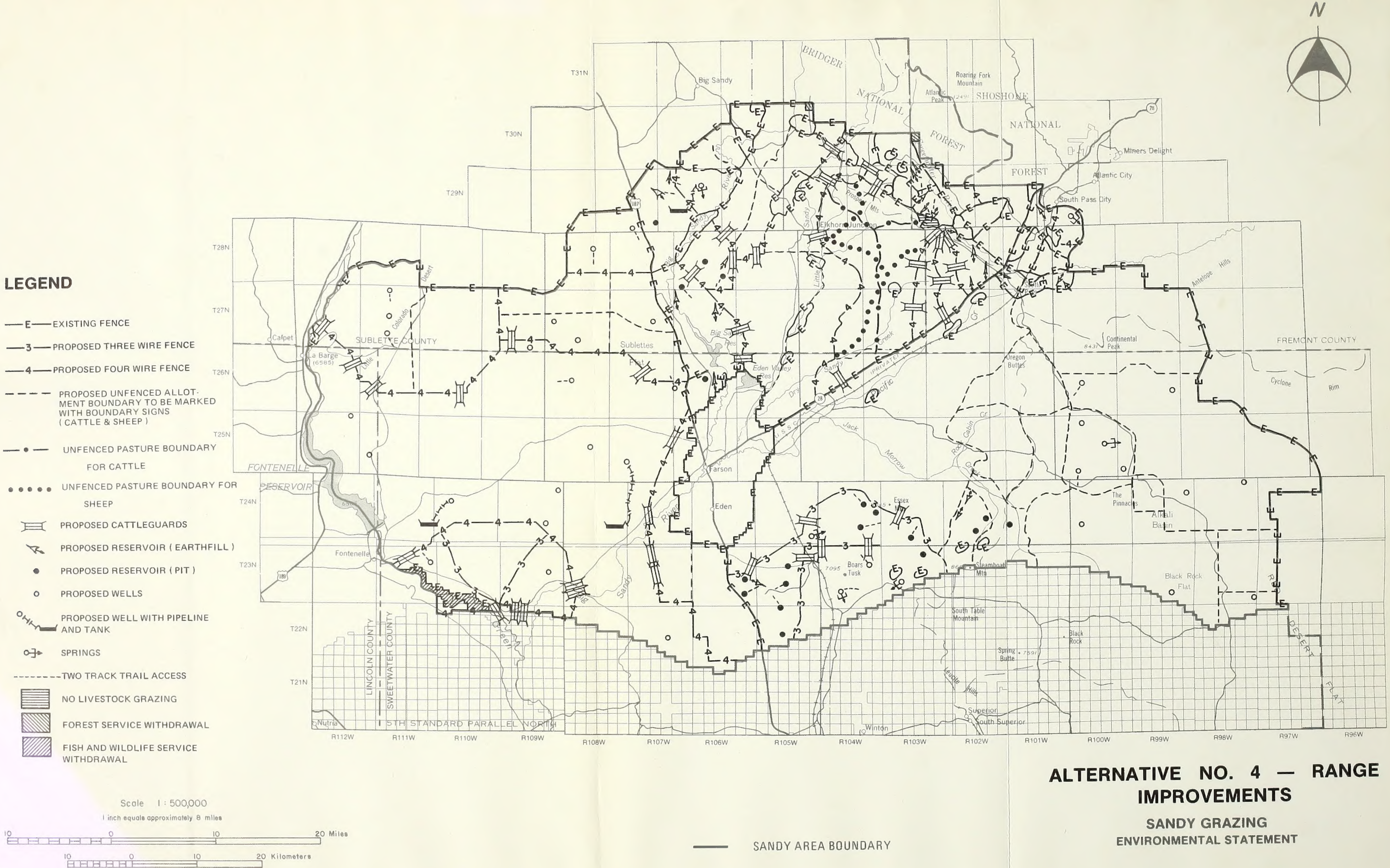
MAP 8-3



ALTERNATIVE NO. 4 — ALLOTMENT BOUNDARIES AND INDIVIDUAL USE PASTURES UNDER OPERATORS' PROPOSAL

SANDY GRAZING ENVIRONMENTAL STATEMENT

MAP 8-4

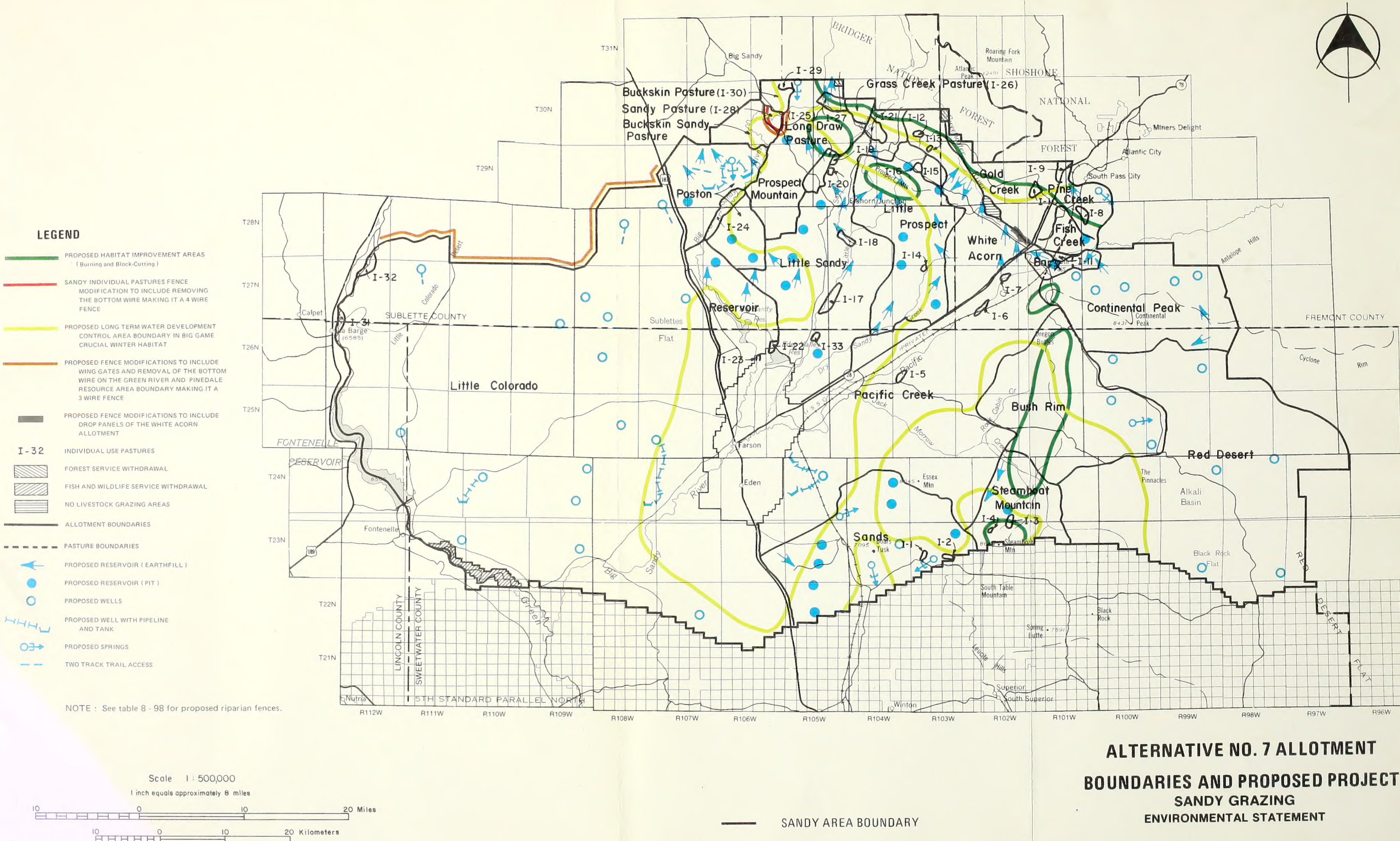


ALTERNATIVE NO. 4 — RANGE IMPROVEMENTS

SANDY GRAZING

ENVIRONMENTAL STATEMENT

MAP 8 - 5



ALTERNATIVE NO. 7 ALLOTMENT BOUNDARIES AND PROPOSED PROJECT

SANDY GRAZING ENVIRONMENTAL STATEMENT

MAP 8 - 6